The Iron Age

A Review of the Hardware, Iron and Metal Trades.

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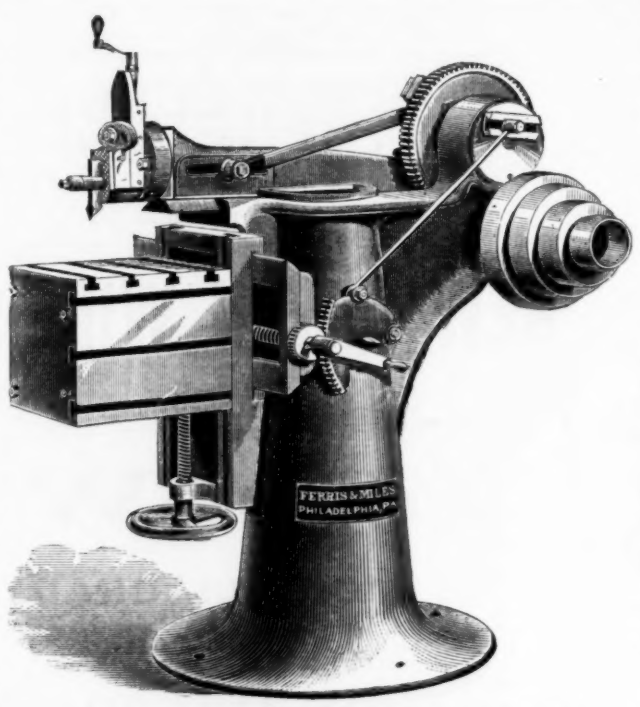
Improved Shaper.

Messrs. Ferris & Miles, Twenty-fourth and Wood streets, Philadelphia, are making a neat, substantial and handy shaping machine, in which special pains have been taken to secure greater driving power than is usually possessed by machines of the kind. For this purpose it is powerfully geared from the driving shaft, the gears being in the ratio of 6 to 1, and the cone is made quite large, with four steps for a 2½-inch belt. This enables the machine to drive heavy cuts and gives sufficient power for long as well as for short strokes. As may be seen from the accompanying illustration, the frame of the machine is a column of neat design, carrying the Whitworth quick return motion, which drives the cutter bar by means of a variable crank. The bar has a stroke of 10 inches. The table is unusually large and has one vertical as well as a horizontal planed side furnished with slots for bolting work. It can be moved up and down by a screw and hand wheel, and made to traverse a distance of 16 inches on the cross slide by a double thread screw worked by hand or by the automatic feed gear.

The feed gear is of the planer type and is at once simple, direct and convenient, allowing of all grades from the fine roughing feeds to ½ inch wide for finishing. It may be driven either way by moving the thumb latch attached to the ratchet gear of the slide screw.

The tool apron is of wrought iron, and furnished with the swivel tool post. The machine is also provided with the rotary arbor and cones for doing circular work; and a pair of centers and clamping vise will be furnished when ordered. The firm are also building larger shapers, with a traveling head, combining great facilities in the manipulation of the feed, &c.



IMPROVED SHAPING MACHINE, BY MESSRS. FERRIS & MILES.

Hydraulic Elevator.

The rapid growth and activity of many of our business houses, the increasing value of ground in our large cities requiring high buildings upon small lots, and the need of ease and celerity in transferring goods from floor to floor, has created a demand for some efficient means of meeting these requirements. Such an agent is to be found in the platform elevator already in use in many of our warehouses.

Elevators have also become a necessity in our large hotels and a convenience in many of our larger but less pretentious buildings. Much attention has been given to supplying as cheap a motive power as possible. Steam elevators of various kinds have been in use for many years, but it has only been comparatively recently that the idea of using a hydraulic machine, worked by the pressure of the street mains, has been put in practice. Among the machines of this class is the hydraulic elevator represented in the accompanying plate, known as Hinkle's patent, and built by Messrs. Stokes & Parrish, Thirtieth and Chestnut streets, Philadelphia, very well known as builders of both steam and hydraulic passenger elevators. The advantages of the latter are mainly its cheapness and simplicity, as the first cost is moderate; and when water from the mains is used the running expenses are very small, as no coal and engineer are required; besides this, the smoothness of motion is greater, as the hoist is accomplished by a single stroke of the piston, and is not liable to the jerky movement sometimes felt in steam elevators, due to the passing of the cranks over the centers.

The machine consists of a long cast iron cylinder, proportioned to the weight and hight of the lift. In this cylinder works an ordinary piston, well packed, with a piston rod passing through a stuffing box. The end of the piston rod carries two equalizing sheaves on a pivoted cross head. Around each of these passes a wire rope which then winds or unwinds from a drum, according to the motion of the piston. The action of these sheaves is to accommodate any unequal stretching of the ropes and to divide the strain. Keyed to the same shaft as the small drum are two larger drums, from one of which the hoisting rope passes over suitable guide pulleys to the car, and of course hoists or lowers it as it is coiled or uncoiled in response to the motion of the small drum and piston. It will readily be seen that the ratio of the travel of the elevator to the stroke of the piston will be the same as the ratio between the large and small drums This is generally as four to one. Of course the travel of the car will be four times the stroke of the piston. Advantage was taken of this principle by the builders in supplying the two larger drums of different sizes, in order to accommodate light loads and quick travel. By the movement of a lever the rope is caused to wind around either the one or the other without further trouble or loss of time. If there is a light load, the large drum will lift the car or platform quicker and cause it to reach the top of the building before the entire stroke of the piston is exhausted, and a corresponding amount of water is saved. If the drum is a third larger than the other, one third of the cylinder full of water will be economized. Where this supply is drawn from the mains and each full trip costs a cent or two, the saving from this device will amount to something in a year's use. Where the pressure of the water mains cannot be applied, a receiver is used of 1500 or 2000 gallons capacity. Into this air is pumped to about 30 lbs. pressure, and then, with the same pump, it is half filled with water, increasing the pressure to 60 lbs. This pump maintains the pressure automatically, being so regulated as to increase the supply as it is drawn off by the elevator. A very little steam and a small pump will answer for this purpose; one pump would supply several elevators if located in adjoining buildings. The whole arrangement is so simple that it does not require the services of a skilled engineer, as anyone with ordinary intelligence can run it. In case the pump is used the water enters the cylinder from the receiver and lifts the car. When it descends the valves are first moved so as to open connection between the cylinder and a tank, when the weight of the car forces the water into this tank, from which it is pumped to the receiver again, and so on, using the same water indefinitely. The valve apparatus is quite simple, and is regulated by an endless wire rope, passing through or by the car. This rope moves a pinion which works a slotted segment. The two valves are moved by two pins worked in the slot; one valve admits the water under pressure from the receiver to the cylinder, the other cuts off connection with the exhaust tank, and the car ascends. When the motion of the valves is reversed the car descends. When the valves are thrown into the intermediate position the car stops. To secure safety, an additional rope is attached to the car in the same manner as the hoisting rope, but an inch or two longer so as to be free from strain. If the working rope breaks, of course the falling car is immediately caught by the safety rope without further damage. Another method, which is sometimes used alone and sometimes in addition to the latter, is to attach a spring catch to the car, fitted to engage in ratchet teeth along the framework of the hoist. This catch is held out of gear by the stress upon the rope; if, however, the rope breaks the stress is relieved, the catch flies out and holds the car in position, thus making accidents almost an impossibility. All these advantages, with the various precautions against loss and injury, make the elevator an important and efficient factor in bringing the upper stories of buildings into easy communication, in accelerating the storage and shipment of goods, and in various ways adding to the comfort and convenience of the occupants.

A Famous English Clock.—A recent issue of the London *Times* contains an interesting article on that famous English clock known the world over as "Big Ben." The dial of this wonderful clock is 22 feet in diameter, the area exactly 400 square feet and the fall of the weight 175 feet. There are five bells for chiming, and the respective weights of the four smaller bells are 80 cwt., 36 cwt., 30 cwt. and 20 cwt. The weight of the hammer is 4 cwt. It ought to be 8 cwt., and until the bell cracked the hammer which was in use did weigh that much. The winding up of the running part takes 10 minutes, but the winding up of the striking parts—the quarter part and the hour part—takes five hours each, and this has to be done twice a week. The error of the clock amounts to only one second for 83 days. The weight of the pendulum is 680 pounds, and it can be accelerated a second a day by putting on an ounce weight. The figures on the enamel transparent dial are 2 feet in length. The frame-work bears the following inscription: "This clock made in the year of our Lord 1854, by Frederick Dent, of the Strand and Royal Exchange, clockmaker to the Queen, from the design of Edmund Beckett Denison, Q. C." Just above the clock room is situated the bell tower, now undergoing repairs. In the center hangs Big Ben, surrounded by the four smaller bells already alluded to. The bell is beautifully chased, and bears an inscription around the lower rim: "This bell, weighing 13 tons 11 cwt. 15 lbs. was cast by George Mears, of Whitechapel, for the clock of the Houses of Parliament, under the direction of Edmund Beckett Denison, Q. C., in the twenty-first year of the reign of Queen Victoria, and in the year of our Lord 1855."

Glass Manufacture in New Jersey.

The extensive and important glass manufacturing interest of New Jersey, which for the past few years has been in a rather languishing condition (attributable to general business troubles and ruptures between the manufacturers and operatives), is showing perceptible signs of revival.

A correspondent of the Boston *Commercial Bulletin* says: Just now, as is usual at this season of the year, the glass works are closed for repairs and alterations, but a general reopening will take place the first week in September, and it is understood the greater number of the leading establishments will be operated to their fullest capacity during the coming winter, as the manufacturers have received heavy orders for wares that will require a long time for their production.

An unusually busy season among the fruit preserving and packing firms of the State has depleted the stock of glassware used for such purposes, and the glass works will have to be run day and night, after their resumption, to replace the stocks of fruit jars and similar vessels that are used in many farming sections during the fall and winter months.

The demand for window glass has also increased this season; the supply on hand is almost entirely reduced, and the production of this article will make the factors interested in its manufacture busy for an indefinite period. From the assurance that the glass men have from the South and West of large contracts, their prospects are certainly very flattering, and additional facilities will be necessitated at some of the establishments to hasten the manufacture of the goods ordered.

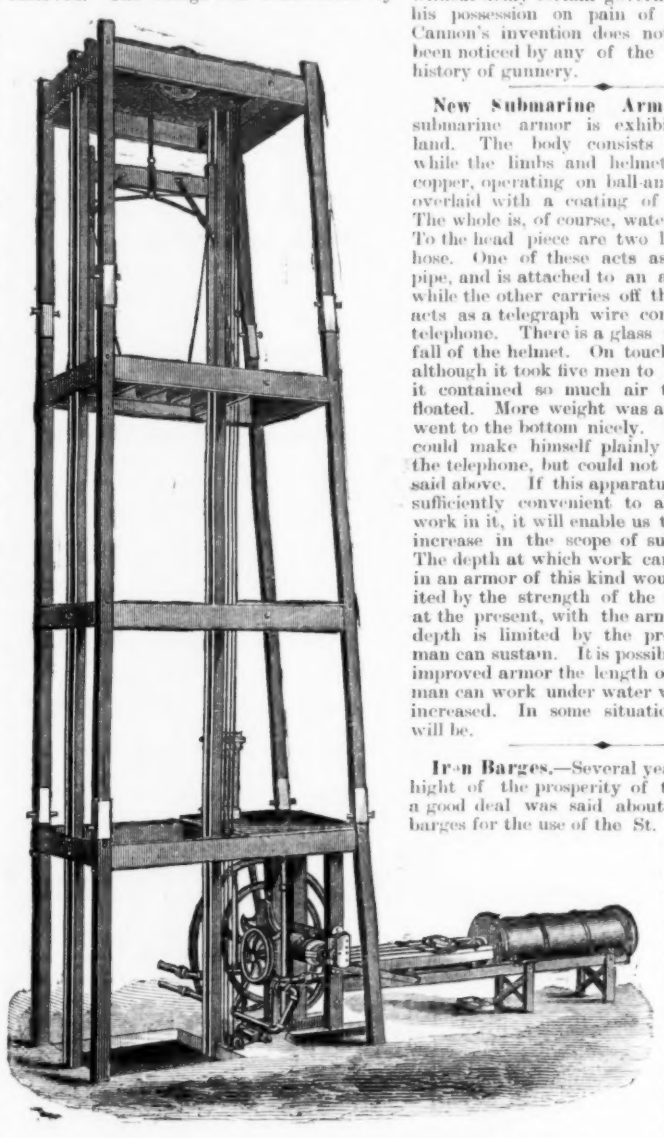
The window glass manufacturing interest is now one of the principal industries of this country, and is destined, eventually, to check the importation from France and Belgium. In fact, many of the American manufacturers have, within the past year, been exporting large quantities of glass and glassware.

There are some 72 establishments in the United States devoted to the production of window glass and glass articles of general use and ornament. Twenty-seven of these are in New Jersey; the others are scattered through New England, New York, Pennsylvania, Maryland, Ohio and elsewhere in the West. The South and West Jersey glass works, however, are popular for producing a larger variety of wares than the establishments elsewhere.

In consequence, too, of the materials used in the manufacture of glass being found right at home, the factors have an opportunity of producing superior manufactures. To make a large market the prices that have ruled for some time past have been materially cut down this season, and still greater reductions may possibly be made, as the trade season makes its advent.

The capital invested in the glass industry is about $6,000,000 in New Jersey alone, while the annual production of the States is between 2,000,000 and 3,000,000 boxes of the various qualities and sizes of window glass. The number of cases of household, druggists' and chemists' goods, and other useful and ornamental wares, is carefully estimated at between 56,000 and 60,000. Several establishments produced thousands of dozens of patented fruit jars, and to these the present season is their busiest.

Military Bridge Building.—Very extensive bridging operations have been recently carried on on the River Elbe by the engineers of the German army. Among other exercises gone through was one of particular interest at the present moment, namely, the construction of a pontoon bridge across the river near Schonebock during the night. Nine companies of pioneers, numbering altogether 44 officers and 800 workmen, were assembled on the occasion, but only four companies were actually employed in the construction of the bridge, the remaining five companies being previously passed across the river on rafts and extended as an advanced guard on the assumed enemy's side to cover the operation. The rafts employed for this preliminary operation were formed each of two pontoons coupled together. Four oarsmen and one steerer were employed on each raft, and each one carried from 35 to 40 men with their arms and accouterments. The time occupied in thus throwing the advanced guard across the river was about a quarter of an hour. The tactical idea for the manœuvre was that the main body of an enemy's army was distant about a day's march from the Elbe, but that patrols pushed forward by him had arrived in the immediate vicinity of the river. It was therefore essential that the bridge should be constructed without these latter becoming aware that the operation was being carried on at the particular point chosen, and, consequently the utmost silence, not only in giving orders but also in putting the material together, had to be observed. The bridge was constructed by



NEW HYDRAULIC ELEVATOR, BY MESSRS. STOKES & PARRISH.

sections of four pontoons each, in order that, should the enemy appear in force before a sufficient number of men had passed over to offer resistance, it might be readily withdrawn, and the whole task was successfully achieved, without a hitch of any kind occurring, in the space of an hour and a quarter, an opening being also arranged in the middle of the bridge to allow floating bodies to pass through.

An Early Breech-Loader.

Among the documents preserved in the House of Lords and mentioned in the recently published Sixth Report of the Royal Commission on Historical Manuscripts, is a petition from one Captain Peter Cannon—the name is appropriate—praying for a reward for his invention of breech-loading ordnance. The petition is dated September 26, 1645, and sets forth that he was one of the first employed to provide the train of artillery for the state, and, to show his fidelity to the cause of God maintained by Parliament, he has spent much time and money in inventing iron and brass ordnance, to be loaded at the "britche," as others now are at the mouth; in this way they may be loaded and discharged much oftener than others, and are more secure by sea and land, to the saving of gunners killed in loading and sponging other ordnance at the mouth. The petitioner prays that, as he has by his own industry discovered this invention never before attained unto, the House would grant him an ordinance for the working and casting of such ordnance, as if any one else should presume to cast any pieces after his invention without his leave, they may be forfeited to the use of the State. We read in the "Journal of the House of Lords," under date September 29, that "an ordinance was this day presented to the House that Peter Cannon shall have the benefit of his invention for the making of ordnance and guns which will prove very advantageous for the Commonwealth. Read thrice and agreed to." This was duly sent down to the Commons, but nothing was ever done, although the Lords sent repeated messages to the Lower House from time to time, and on March 26, 1646, they again "put the Commons in mind of Captain Cannon's business. He hath deserved very well, and they desire that consideration may be had of it." The captain does not appear to have taken out a patent for his invention; it must probably be added to the list of those which all have agreed to admire but none to reward. It is, however, just possible that there may have been some reason why he went unrecompensed, as there is an entry in the Parliamentary journals of the day to the effect that Captain Peter Cannon—in all probability the same—was sharply admonished to return without delay certain government stores in his possession on pain of imprisonment. Cannon's invention does not seem to have been noticed by any of the writers on the history of gunnery.

New Submarine Armor.—A new submarine armor is exhibited in Cleveland. The body consists of Otis steel, while the limbs and helmet are of beaten copper, operating on ball-and-socket joints, overlaid with a coating of heavy rubber. The whole is, of course, water and air tight. To the head piece are two lines of rubber hose. One of these acts as an air supply pipe, and is attached to an air force pump, while the other carries off the bad air and acts as a telegraph wire connected with a telephone. There is a glass window in the fall of the helmet. On touching the water, although it took five men to lift the armor, it contained so much air that it almost floated. More weight was attached, and it went to the bottom nicely. Here the diver could make himself plainly understood by the telephone, but could not hear what was said above. If this apparatus proves to be sufficiently convenient to allow a man to work in it, it will enable us to make a vast increase in the scope of submarine work. The depth at which work can be performed in an armor of this kind would only be limited by the strength of the material, while at the present, with the armor in use, the depth is limited by the pressure which a man can sustain. It is possible that with the improved armor the length of time which a man can work under water will be greatly increased. In some situations it certainly will be.

Iron Barges.—Several years ago, in the hight of the prosperity of the iron trade, a good deal was said about building iron barges for the use of the St. Louis produce trade more particularly. They were not built then, and it is just as well perhaps that they were not. The Des Moines canal had not then been completed. The jetties had no existence save in the brain of their originator, and the high price of iron and labor would have made the barges cost much more money than they will cost now. When the discussion respecting the building of iron barges was progressing in St. Louis, the means of constructing them had not been provided. But now there is a yard where such work is done, properly equipped with the necessary plant for a successful prosecution of the work, and there is no reason why a line of light draft iron barges may not be put afloat whenever wanted. Iron is much cheaper than it used to be. Labor is very much lower also, and there are greatly improved prospects of river business. The railways have fought the waterpaths until they have greatly impared their own value, and in some cases have completely wrecked themselves. Now they will try the plan of charging a paying rate of freight without attempting to compete for the bulky business which can be moved so much more economically and comprehensively by water. The Missouri River, the Upper Mississippi and the Illinois rivers need a line of iron barges, owned by a strong, live, energetic company, who would not only furnish the barges but see to it that their barges got produce to carry. There is a good opening now for such an enterprise, and the remainder of the present century may not afford a more favorable time for the building of the barges than the present.—*St. Louis Republican.*

Value of Land in London.—A plot of land at the corner of Gracechurch street and Cornhill, covering an area of about 850 feet, has recently been let on building lease by Messrs. Harvey & Davids at a rental of £1650 per annum, or equal to nearly £2 per square foot.

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SEE PAGE 9.

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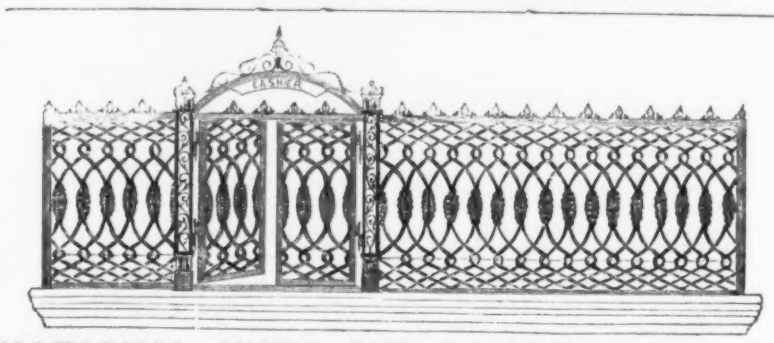

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The Burleigh Tunnel.

This tunnel now penetrates into Sherman mountain a distance of 2200 feet, and is still being driven in as fast as the Burleigh air compressors and high explosives, guided by skill and experience, can accomplish the work, which is at the rate of about two feet per day. Messrs. Loring, Nickerson & Green are the contractors, and they are progressing satisfactorily, though not as fast as they have done the past four months, on account of the increasing hardness of the rock. The holes are drilled with double-bitted drills from six to eight feet deep; the boring machinery is run back on the track about 200 feet and the blasts exploded. The gases resulting from the combustion of the giant powder are highly noxious, but the deleterious effects are more likely to be felt a distance of 200 feet or more from the heading of the the tunnel than right up at the breast where air is supplied by the compressors.

Twenty lodes have already been intersected by this colossal prospecting enterprise, two of which have been worked extensively, and immense quantities of ore have been taken out. The principal lode as yet discovered is the New Era, which generally carries a body of solid ore from two to three, and in some places as much as four feet in thickness. This, however, is of low grade, but owing to the increasing facilities for transportation and treatment of this class of ore, it cannot fail to prove highly remunerative; indeed, a vein half the size of this would be a bonanza in any other place than Clear Creek county, where silver is the ore that is most particularly sought after and devoutly wished for; but the time is not far distant when many of the mines in this county that have not been touched for years will be actively worked for the lead they contain, and will yield handsome profits to their owners.

The New Era was cut 920 feet from the commencement of the tunnel, and has been opened out by drifting 250 feet each way. Fifty feet west from the tunnel a winze 40 feet deep has recently been sunk, and a drift is being run west from a point in the shaft 35 feet below the tunnel level. This will open up a stope carrying a vein of galena of incredible size and undoubted permanency, the upper edge of which forms the floor of the drift above. This lode is 14 feet in width, dips to the north at an angle of 35 degrees, and its course is nearly east and west.

The Rider lode is 1700 feet from the tunnel's entrance, and has been partly explored. We did not examine this vein, but Mr. Loring, the foreman to whom we are indebted for much, valuable information and a ride on the car from the breast to the mouth of the tunnel, informs us that a drift has been run east on the lode 40 feet, and another one west 80 feet.

We have confidence to believe that the persevering efforts of the Burleigh Tunnel Company to discover something else will ultimately be rewarded, and we never know the day or the hour that we may be called upon to chronicle the discovery of the "biggest thing yet" by this company in the unexplored interior of Sherman mountain.—*Colorado Miner.*

Torpedoes.

Attempts have been made to classify torpedoes, but the new arm in warfare is as varied as if it belonged to Briareus. Several torpedo contrivances have been already described in *The Iron Age*, and attentive readers are by this time familiar with the construction and operation of the more noted ones, such as the torpedo used on the Russian launches, that being principally a mass of gun-cotton fixed on the end of a spar, and needing to be carried by a brave crew to its destination; the Whitehead or fish torpedo, which is started by being shot out of a tube under water, and possesses its own means of propulsion in a screw worked by compressed air, driving it beneath the surface at the rate of twelve to twenty miles per hour for a distance of one or two thousand yards; the Lay torpedo, an American invention, which is managed from shore by a line that unreels as it proceeds, the line carrying an electric wire that controls machinery within the torpedo, and determines all its motions at the will of the operator. It is difficult to speak with certainty of the comparative merits of different torpedoes, but if the Lay torpedo can do all that is claimed for it, it should be the best, as it is certainly the most manageable. Its motive power is compressed carbonic acid. The objections urged against that torpedo by foreign critics are an alleged want of speed, and the possibility that its approach may be detected by the flag it carries to let the operator know its whereabouts. Neither of these objections appears to be important. Besides the foregoing, there is a torpedo well spoken of that is managed by towing. It is the invention of an English officer, Capt. Harvey. When the tow-rope of this machine is slackened, it dives beneath the surface, and is then ready to explode on impact. The rocket float is another, in which a burning rocket drives a torpedo on a sort of canoe with great speed over the surface of the water. An invention of almost equal promise is a torpedo carried by a small balloon. The torpedo is so arranged as to fall from the balloon at the expiration of a given time. The direction of the balloon is not necessarily that of the wind, as suitable vanes give it a divergence. With practice it is thought this torpedo can be made to drop very nearly if not quite on a spot 100 feet square, at a distance of three or four miles.

The foreign timber trade of America is evidently on the increase. Usually the month of June, for instance, brings England about six times as much hewn stock from Russia as from this side of the Atlantic, owing to the fact that spring goods from the East get to market sooner than those from the West; but this year the "colonies" shipped 29,737 loads in June against 46,883 loads from the Baltic—less than a half more instead of six times as much as ordinarily. The mother country regards his as an indication that the American import trade has only just fairly begun, and that she need have no fears of a deficiency in her pine timber supply; or, as a London cotemporary puts it: "If in the month of June, when we have heretofore looked more to Northern Europe than to America for our supply, America has made such a formidable increase of shipments to this country, what may we not expect further on? for there is also a very large addition to its supply of swan wood for the same month, being 27,715 loads above the amount that came forward in June 1876, and in fact 20,927 loads more than we received from Russia during the same period." It will be seen, therefore, that this branch of the import trade is steadily increasing to conform to the spirit of the times for searching out new markets.

The Weimer Blowing Engine.

The Lebanon, Pa., *Courier* says: During the past week a series of experiments have been conducted at the Weimer Machine Works with the short-stroke blowing engine built at the establishment for the Ogden Iron Company of Chicago. The new engine has a 36-inch diameter steam cylinder, with 72-inch diameter blowing cylinder, both cylinders having 3-foot stroke. Before shipping the engine, Mr. Weimer determined to test its powers to their fullest capacity, and for this purpose connected the engine with the boilers of the works, forcing the blast generated into a large air receiver especially erected for testing blowing engines.

A large number of indicator diagrams were taken of both steam and air cylinders under various speeds and pressures. The air pressure was frequently run up to 14½ pounds, and the speed attained was often over 75 revolutions per minute. The friction or "lost power," as shown by the indicator, was only 3¼ per cent., and at times less than this trifling amount.

Every calculation of the builder and designer was fully realized by actual practice, and from 10,000 to 12,500 feet of cubic air was discharged per minute at pressure varying from 6 to 14 pounds per square inch.

The Weimer Machine Works have always been working toward cheapening the cost of erecting blast furnaces, and this last effort will reduce the cost of the blast-producing power to one-half that paid for the ordinary blowing engine. A large number of furnace proprietors from a distance, as well as our home management, visited the works during the progress of the experimental trials, expressing themselves highly pleased.

There was also on exhibition at the Weimer Works two sections of Mr. Weimer's suspended hot-blast stove, an invention which is interesting to iron men. This stove has been adopted by the Baltimore Iron Company, and a letter from one of the officers speaks of it in the most flattering manner. Inquiries are being made from the iron districts from all parts of the country relative to Mr. Weimer's improvements and inventions.

The "Crimper" Strike in the Glass Trade.—The condition of the glass manufacturing trade of Pittsburgh is not as encouraging as it should be, although the flint houses are in full operation, with but few exceptions. These houses manufacture what is known as pressed or table ware. The establishments of Messrs. Doyle & Co. and Duncan & Sons are the latest to start, having commenced operations during the present week. In most of the shops the manufacturers allege that the mechanic is receiving the same wages paid for the last eight years, and with low market prices and railroad discrimination the prospects for Pittsburgh manufacturers is anything but favorable. In the lamp chimney trade the situation is still more gloomy. In a "move" of six hours, or a half day's work, 50 more chimneys are turned out by the simple patent process. By the former process the blower "crimped" or scolloped the chimney by hand, but by the machine the tending boy does the work, which is more uniform and performed with less waste by breakage. The machine was invented by Mr. Thomas B. Atterbury and sold to Messrs. Dithridge & Co., of the Fort Pitt Works. The blowers object to work this machine on the grounds that it will overstock the market, and will ruin those who do not use the patent in the manufacture of chimneys—an assumption which is certainly preposterous on the part of the workingmen. They say they will agree to work the machine provided the employer allows the same number of chimneys for a day's work. The result of this strike will be, if successful, to drive this machine to the Eastern manufacturing district, to the total destruction of the manufacturing interests here. The manufacturers claim that while materials have greatly decreased in price the workmen are receiving the same wages paid during the past eight years, and that their profits are actually smaller notwithstanding these reductions in the raw materials.—*Chronicle.*

Flue Dust.—The working of the flue dust at the Lemmon mills is progressing very favorably. The proprietors find no trouble in extracting the silver and lead, but the gold contained in the dust has as yet eluded the process. This trouble is laid to the coarseness of the article, and it is being run through the sample mill at the Consolidated Works. It is thought that by grinding it to the required fineness all of the precious metals can be saved. The roaster is working well, and the pans, concentrators and agitators, although of an old-fashioned pattern, are doing much better work than was anticipated. Some trouble has been experienced with the machinery, its long disuse and necessity of adapting it to the work causing some delay. The firm are very much encouraged with their experiments, and have no fears of the ultimate success of the enterprise. The importance of the new process, in the event of its success, can hardly be exaggerated, adding, as it does, 13 per cent. to the value of every ton of smelting ore extracted from the mines of the district.—*Eureka Sentinel.*

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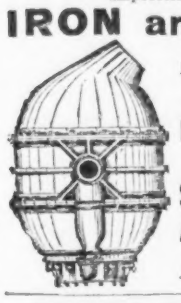

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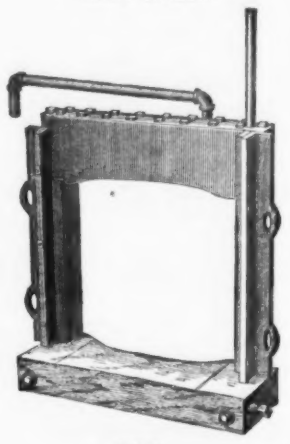

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II.

COAL.

Lehigh Valley coal is considered the best coal for melting iron because it is harder than some of the other coals and is more free from sulphur; but coal from the Lackawanna Valley and Schuylkill Valley, or Pottsville region, is also extensively used in the melting of iron in foundries. In selecting coal for the cupola care should be taken to get as hard and solid a coal as possible, and a coal that will not slack down when the heat strikes it. Most any of the anthracite coals can be used for melting iron in cupolas. When the coal is soft or poor a much larger percentage of coal must be used, and the charges of coal must be increased in weight toward the last of the heat, as will be seen by reference to melting done at the car works at Berwick, Pa., where the coal used was soft coal from the Wilkesbarre region.

LARGE COAL.

The majority of foundrymen and melters believe that it is impossible to melt iron without large coal, and they will always select the largest lumps they can get and put them in for the bed. Some plate or other light scrap is then charged on the coal to prevent it from being broken up by throwing in the pig or other heavy iron. This they claim makes a bed that will last longer and do better melting than a bed of small coal. The first charge of iron is put in on the bed, and then the second charge of two or three hundred of coal is put in in large lumps as before, and probably will not more than half cover the bed of iron. The next charge of iron is then put in and the next charge of coal in the same way, and so on. The blast is put on, and the cold wind finds the large openings between the large lumps of coal (which will naturally be formed by throwing large lumps of coal in a pile), and will penetrate to the center of the cupola before it becomes hot. The iron is melted on top of the bed and runs down through the large lumps of coal like water through a stone pile, and passes through the cold blast which is constantly coming in, and the iron is decarbonized, chilled and hardened. The "old fogy" idea of using large coal for melting iron in cupolas is the cause of more hard and uneven iron than anything else.

SMALL COAL.

I have made some thorough tests in melting iron with different sized coal, and I have found that good melting can be done with any size if the coal is good. The egg size coal is a good size for small cupolas, and what is known as grate or steamboat coal is the best size for large cupolas, and I should recommend it for the melting of iron in cupolas in preference to large coal for the following reasons: It will pack closer in the bed than large coal and will last equally as long; the blast will be heated before it can penetrate any distance into the cupola; the iron, being melted on top of the bed, will be slowly filtered down through the bed, and will be purified and superheated before it reaches the sand bottom. The second charge of two or three hundred of coal can be spread over the charge of iron so as to completely cover it and separate the charges of iron, thus making the iron melt at a more even temperature, which will make a softer and a more even iron. A smaller percentage of coal will be necessary than when large coal is used. Foundrymen should be careful when using small coal to get the best hard coal, as it produces the best results.

COKE.

Coke is extensively used for melting iron in cupolas for foundry purposes through the Western and Southwestern States. Connellsville and Pittsburgh coke is considered the best coke for foundry purposes. The Steubenville and other Ohio cokes are sometimes used for melting iron, but they contain so much sulphur that they cannot be used in melting iron for stove plate or other light work, as the coke does not have body enough to give life to the iron and the sulphur hardens it and makes it brittle. Gas-house coke is sometimes used for melting iron, and does very well when it is made out of Connellsville or Pittsburgh coal, but it has not as much body as the Connellsville or Pittsburgh coke, and more of it has to be used to give life to the iron. Gas-house coke made from cannel coal cannot be used for melting iron in cupolas. Poor coke will improve if left lying out in the weather for a long time. Wet coke seems to make hotter iron than dry coke.

COAL AND COKE.

When coke is used for melting iron in a cupola a much larger heat can be melted than could be melted in the same sized cupola with coal. Coke will melt iron faster than coal. Coal or coke will make iron equally hot and fluid. Coal will make more slag than coke, and the cupola will be harder to pick out when coal is used than when coke is used. Iron will take up sulphur more readily from coke, and will be infused more from sulphur in coke than from sulphur in coal. Poor coke is worse than poor coal for melting iron. More blast is required for melting iron with coal than with coke. I have seen a great deal of melting done with both coal and coke, and I consider that equally as good melting can be done with the one as the other.

CHARCOAL.

Charcoal will make iron softer, stronger and more fluid than coal or coke. Yet notwithstanding these facts, charcoal has, on account of being expensive, been generally abandoned as a fuel in the melting of iron in cupolas for foundry purposes, although it is still used in some parts of the country where wood is plenty and coal or coke is expensive, or when the quality of the castings is more of an object than the expense of making them. When charcoal is used for melting iron in a cupola the cupola should not be as high as the coal or coke cupola. Three or four feet is the best height for a charcoal cupola. The iron should be charged in small charges and a mild blast used. Only small quantities of iron can be melted at a time with charcoal fuel.

CUPOLAS.

The cupola furnace has almost entirely taken the place of the reverberatory furnace for melting iron in foundries, because they have the advantage over the reverberating furnace of melting either a large or small amount of iron, and of melting it faster and hotter and with less fuel; but iron melted in the cupola furnace will not make as strong or as sound a casting as iron melted in the reverberatory furnace. To overcome this disadvantage the foundryman has adopted the theory that he will sell you a casting cheap, and if it breaks he will sell you another one cheap. The cupola furnace has been in use for a great many years, and is almost as old an invention as the reverberatory furnace. Cupolas were first built in England and in this country with a stationary fire-brick hearth or bottom, and a large opening was left in the front, through which the dump, or refuse, was drawn out with hooks in place of dumping it by dropping the bottom. The large opening in the front was filled in with sand or loam, and a plate fastened in front of it to prevent it from being blown out, and the tap-hole was put in the same as at the present time. The old style draw cupola, as it is called, is still in general use in England, and some few are still in use in this country in some of the Southern States. I saw three of them in use in a foundry in Baltimore two years ago. But the draw cupola has, as a general thing, been replaced in this country by the drop-bottom cupola, which is an American invention. With a view of making some improvement in cupolas, foundrymen have constructed them in all shapes and of all sizes and forms, and tuyeres have been put in in different shapes for admitting the blast into the stock. I have shown or described some of the principal cupolas in use at the present time that I have melted iron in or seen it melted in; but I do not consider any of the new style or odd-shaped cupolas superior to the common straight cupola for melting iron or for economy in fuel. In order to do good melting in any cupola the lining must be kept in proper shape, as explained further on.

CONSTRUCTION OF CUPOLAS.

When constructing a cupola the first and most important thing is to decide where it shall be put. In deciding this question there are two things to be considered; the first is, Where will it be the handiest to get the iron and fuel to it? and the next is, Where will it be the handiest to get the iron away from it? The latter is by far the most important point to be considered, especially in foundries where light work is made. It is easier to wheel pig iron to a cupola than it is to carry molten iron away from a cupola, and the cupola should be set as near the center of the foundry as possible, so that the iron can be carried away from it in all directions, and so make the distance to carry it as short as possible.

THE FOUNDATION.

A good solid stone foundation should be put down for the cupola to stand upon. If the foundation is not solid, it is liable to settle when the weight of the cupola and stock comes upon it, and may crack the bottom plate, which will make trouble. The height that a cupola should be from the floor will vary according to the class of work that it is intended for. In stove-plate foundries, where the iron is all carried in hand ladles, the average height is from 10 to 20 inches, and in machinery foundries, where large ladles are used, the average height is from 2 to 3 feet. When the cupola is very low a pit should be put in, so that the bottom can be dropped and the refuse taken away easily. This pit may be put in on any side of the cupola where it will be most convenient. When put in front of the cupola it may be covered with cast iron plates and the plates covered with a few inches of sand to prevent the iron flying in case any is spilled. Cupolas may be set on brick walls or on iron columns. When the cupola is set high the columns are the best, as they will last longer than brick and are handier to get around. Care should be taken not to set the cupola too high, as the iron will sparkle and fly in falling into the ladles, and a great deal of it will be wasted in the course of time.

BOTTOM PLATE.

The bottom plate or ring upon which the cupola stands should be made of good strong iron, and cast with strengthening ribs on it, so that it will not break when the weight of the cupola and stock comes upon it, for if the bottom plate once gets broken it will always make trouble in putting up the doors and putting in the sand bottom, and make it more liable to cut through and run out. In small cupolas the bottom plate should only come flush with the inside of the brick lining, so as to allow the sand bottom to fall out easily when the door is dropped. In large cupolas the bottom plate should project 3 or 6 inches inside of the brick lining, so as to make the door smaller and easier to handle. When the bottom plate projects inside of the lining, the lining should be arranged so as not to give the sand bottom too much bearing and prevent it from dropping out easily.

THE IRON BOTTOM.

The cast iron drop door, divided into two or more pieces, is generally used for the bottom. It should be made as light as possible so as to be easily raised. Wrought iron doors are sometimes used on account of being lighter and easier raised. They answer equally as well as the cast iron doors. The door or doors should be supported by a good solid prop under them, and not by a latch that is liable to give way at any time and burn everyone around the cupola. Slide bottoms are sometimes used for large cupolas. These bottoms are divided in the center and rest upon a slide at each end. They are shoved forward into place with a bar and drawn back by a chain and windlass. The slide bottom makes a very good, safe bottom, but it is not always as convenient as the drop door. The iron bottom should be perforated with small holes to allow the steam and gas from the sand bottom to escape without passing up through the molten iron.

CAISSON OR SHELL.

The caisson for cupolas should be made out of boiler iron, or heavy sheet iron bars of angle iron should be riveted around on the inside of the caisson about 3 or 4 feet apart, so as to support the lining, and in case part of it gives out, to admit of its being taken out and repaired without taking down the whole lining. The angle iron also stiffens and strengthens the caisson and is better than brackets. The old style cast iron stave caisson with a brick stack is still made and used in some parts of the country. They are more expensive than the boiler iron caisson and are not near so good, as the staves are liable to break from the expansion and shrinkage and crack the lining and allow the blast to escape. The caisson should be well painted with coal tar to prevent its rusting and make it last longer. The caisson will often rust through and give way near the bottom in a short time. This is caused by the lining sweating and the moisture settling at the bottom, and by putting in a heavy sand bottom and allowing no way for the moisture in the sand to escape, this keeps the lower courses of brick always wet and damp, and the rust soon eats through the caisson. This trouble may be overcome by laying the first two or three courses of brick out 1 or 2 inches from the caisson, so as to form a small air chamber all around the bottom of the cupola. The bottom of the caisson should be perforated with small holes to supply this chamber with fresh air and allow the steam and moisture to escape.

CUPOLA STACK.

The diameter of the stack should not be more than one-half the diameter of the caisson, so as to concentrate the heat. It should be drawn in just above the charging door, so as to throw the heat downward on the stock. The stack should be high enough to give the cupola a good and even draft. A cupola with a good draft will melt better and make softer iron than one with a poor draft, for the nearer we can come to a natural draft the better for the iron. More power will be required to drive the fan or blower when the cupola has little or no draft, for the blast has to be *forced* clear out at the top of the stack.

I consider the stack one of the most important parts of the cupola.

THE SCAFFOLD.

The scaffold should be built large enough to keep stock sufficient for a rainy day or an accident and have plenty of room to get around. The floor should be made of cast iron plates properly fitted together so as to be fire-proof and easy to shovel scrap or fuel off. The scaffold should be cleaned up and the floor swept every day, so as not to get too much dirt and sand into the cupola.

CHARGING DOOR.

The charging hole should be large enough, and so arranged that the melter can throw in the iron with ease, and at the same time see where it lights and how it lies. The door should be made to fit close, and lined with fire-brick to prevent it from warping. A cast iron door frame, filled in with fire-brick, makes the best door for a cupola. Two charging holes are sometimes put in, in a large cupola (one on each side), for convenience in charging the stock. Cupolas are arranged in this way at James L. Haven & Co.'s novelty foundry in Cincinnati, Ohio, and at Smith & Sons' pipe foundry in Pittsburgh, Pa. Two charging holes are generally put in in all large cupolas where coke is used as a fuel.

ELEVATORS.

There are a great many ways of getting the stock upon the scaffold. At some foundries the iron and fuel is all thrown upon a platform, and from there thrown upon the scaffold. This is a very poor way of getting up the stock, as it makes a great deal of unnecessary handling of the iron, and there is a great deal of the fuel wasted by being broken up fine, so that it is not fit for use in the cupola. Other foundries have a runway, and wheel up all the stock in wheelbarrows. This is a better way of getting up the stock than by throwing it up; but it is very hard work wheeling up iron, especially if the runway is very steep, as it generally is. In most of the large foundries they have steam elevators for taking up the stock. These elevators are very handy, and take up less room than a runway does, and the saving in labor will soon pay for the expense of the elevator. The expense of running an elevator is very little, for it is only run an hour or two each day. There are several different kinds of elevators in use in foundries; but the principal one in use is the common straight steam elevator. Where it is desirable to carry the iron some distance, as well as elevate it, other kinds of elevators are used. In one foundry that I visited, where the stock was all kept in the cellar, an inclined plane elevator was used for taking the stock upon the scaffold. This elevator was made by running two endless chains over two shive pulleys at the top and two at the bottom, and fastening shelves or buckets on to the chains. The stock was put on at the bottom and dropped off at the top as it went over the shive pulleys. This makes a very good elevator, and is better adapted to some foundries than the straight elevator. In other foundries an inclined plane railroad is used, with a car drawn up by a rope or chain. This style of elevating the stock is very good where it is kept in the yard at some distance from the foundry, and where there is plenty of room; but it is not so well adapted to foundries where room is an object.

SCALES.

A good pair of scales should be kept on the scaffold, and all the stock that goes into the cupola should be weighed accurately. The scales should be swept off after every draught, and kept in good order. Most foundrymen think that any old scales are good enough for the scaffold, because they neither buy nor sell by them, but are merely dealing with themselves. It is very true that they are only dealing with themselves, and they are cheating themselves out of hundreds of dollars' worth of fuel every year. Some foundrymen do not have any scales at all on the scaffold, but depend upon the melter guessing at everything he puts into the cupola. Guessing at the amount of the stock charged is often the cause of slow melting, of dull iron, of irregular melting, of running short of iron and of burning out the lining in a short time, &c. There is not a foundryman in the country who depends upon the melter to guess at the weight of the stock he charges but what could save enough in one year to buy two or three pairs of good scales by having his stock accurately weighed. There is nothing gained by having a good pair of scales on the scaffold unless you see that the stock is carefully weighed and no more fuel used than is actually necessary.

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Bridging the Bosphorus.

Col. James B. Eads, engineer of the iron bridge at St. Louis, and who has so successfully planned and constructed the jetties at the delta of the Mississippi River, has also made elaborate plans for a grand iron bridge over the Bosphorus, connecting Pera—European Constantinople—with the Asiatic shore. This project of the distinguished engineer is now for the first time made public through the courtesy of Mr. A. O. Lambert, civil engineer, who has been largely connected with great works of railway and bridge construction in several countries of the old world, and also in Nebraska, Montana, Idaho and particularly in the Southern States. Mr. Lambert, in conjunction with Capt. Eads, drew the plans, made the calculations and assisted at the surveys. It will be seen that the work, when constructed, will be the most important of the kind ever completed, affording to the Turks, if that day ever comes, a ready back door out of Europe, in which they took up their residence some 400 years ago.

The bridge will be about 6000 feet long—over a mile; will have 15 spans; will be 100 feet wide, and, save the masonry and flooring, will be built of iron. The height of the roadway above the surface of the water will be 120 feet, thus affording ample passage ways beneath the arches for ingoing and outgoing ships. It will be observed that this elevation of the bridge above the Bosphorus is some 60 feet less than that of the Brooklyn bridge above the East River, with the difference that the latter is a suspension bridge, while the former will present a series of 15 bold arches thrown over the most attractive waterscape in the world. The greatest feat of engineering will be the bold central arch, 750 feet span—over an eighth of a mile. This is the longest span ever contemplated, and its construction will necessitate the most careful labor and no small outlay of money. In order to accomplish this single portion of the work alone, two caissons will have to be sunk in over 100 feet of water; and this can only be done by coffer-dams and special contrivances, in their completeness yet unknown to engineering. The current at the point where these piers will rest is very strong, coming through the Dardanelles from the Sea of Marmora, and rushing to the Black Sea. The two central piers constituting the backbone of the bridge, will be 50 feet thick, of solid granite blocks, locked together with iron braces. A side view of the bridge will present below the highest points of the arches an intricate system of reinforce braces. It is in this part of the construction that great ingenuity, nice mathematical calculation, and delicate mechanical skill must be employed. By an invention of Capt. Eads a new feature will be introduced, so that a train of cars or any other heavy burden will not superimpose its weight at any one point over which it may be at the moment, but will be distributed throughout the 6000 feet of the supports, thus practically making it an easy task to build an arch of 750 feet. This is accomplished by uniting all the main bracing from pier head to pier head, and connecting the minor rods, so that the whole forms a complete system, making one brace dependent on the other. The action of heavy weights, of troops marching to a common step, of rapid locomotion by the cars, is thus instantly communicated through every foot of the supports, and every part is made to do its duty. It will be remarked by the traveler who has carefully noted the vibratory motion of the suspension bridge, two miles below Niagara Falls, that the strain on the guy braces is very unequal, and at times, when the structure has been put to severe service, these braces have suddenly become taut, threatening to release themselves from their fastenings. No such difficulty is apprehended in the projected bridge over the Bosphorus. Besides the main span of 750 feet, there will be two spans of 500 feet each adjoining the central one, and the distance between the arches will go on diminishing as the bridge approaches either shore until the arches reach the minimum width of 200 feet.

The Turkish and French governments, preliminary to this work, caused a very careful survey of the harbor of Constantinople to be made, as the bed of the Bosphorus was imperfectly known—known only, in fact, by the British admiralty charts. It was found by using deep sea leads and the patent sounder, which are both armed with grease, that there was about 3 feet of alluvial mud overlying 15 feet of sandy strata, and beneath was found solid rock. Capt. Eads' peculiar experience in sinking the piers of the Mississippi bridge will come into play in the difficult work of laying these pier foundations. The river at St. Louis is 60 feet deep. Capt. Eads was daily in the bottom, living a regular diving-bell existence. He found that the water at the bottom of the stream moved with great velocity, carrying with it large bodies of sand and earth held in solution, eventually to reach the delta channel, silting them up and closing the gateways to commerce. The currents in the Bosphorus do not reach any such velocity, and while the greater depth will render the construction of coffer-dams and caissons a labor of longer duration and greater expense, there will be no insurmountable difficulties in the way. Perhaps the magnitude of the undertaking may be better understood when it is stated that the main piers will be 270 feet high from the foundation to the summit. The aggregate height of the 15 piers would make a single pier of half a mile in height, or eight times the altitude of the ball on the top of St. Paul's Cathedral, London.

It is estimated that the cost of construction will not exceed $25,000,000, and the time to complete it six years. It took about eight years to build the St. Louis bridge; but in the case of the projected one over the Bosphorus the conditions are very different. Excellent granite can be found in desirable quantities near the place of construction and the labor will be very cheap. There exist few such impecunious populations as those which inhabit the districts about Constantinople. It is also a question, in considering this branch of the subject, whether "Chinese cheap labor" cannot be as profitably employed as it was in the construction of the Union Pacific Railway. In the estimate of $25,000,000 as the cost of construction, an outside figure has been given, for it is thought, with vigorous economy, and the preparation of the ironwork in France and Belgium, that the bridge may not ultimately cost over $18,000,000. It is believed that the great rise in property that would take place on the Asiatic shore would more than pay for the construction. There is a very large class of wealthy and well-to-do people who reside along the banks of the Bosphorus, and particularly on the European shore. Every few moments steamers come and go from the pier heads at the junction of the Golden Horn, carrying passengers away to suburban homes like Astoria and Nyack, for few people care to live either in Stamboul or Pera. Pera, where the bulk of foreign residents live, in the city, is built on a hillside, with narrow, filthy and circuitous streets, and the story of its oft-recurring fires, epidemics and miserable street cars has frequently been written. No greater boon could, therefore, be conferred upon the people of Constantine's city than the construction of the bridge so ably planned by Capt. Eads and Mr. Lambert.

Central American Trade.—An American, long a resident of Nicaragua, and familiar with the resources of Central America and the habits and customs of the people, has lately contributed a series of interesting letters, setting forth the benefits that would accrue to the United States by making a ship canal across Nicaragua. He claims that such a thoroughfare would make New York the central commercial city of the world, and make San Francisco her associate. Besides this, he says, it would give American planters, mechanics and merchants an immediate and near field to create another India in place of that which is rapidly forestalling even our domestic products. Last year India sent nearly 3,300,000 cwt. of wheat to England—one-sixth as much as the United States, and one-third as much as Russia. The British revenue from India is $250,000,000 a year, or nearly the total cost of operating the United States government. The army in India employs and subsists 200,000 of her majesty's subjects and controls 240,000,000 of human beings. They make a commerce of $500,000,000 a year—cotton, jute, rice, tea and indigo leading. They give employment to 10,000 vessels and to 6500 miles of Indian railroad, in which $500,000,000 finds a profitable investment. In Spanish America, which repeats nearly every natural production of India, and adds many others exclusively its own, there are less than 30,000,000 people, more than two thirds of whom live on the Pacific slope, they are weary of revolutions, ripe for orderly government, hospitable to strangers, and frugal. With the help of Yankee organizing power and machinery, the writer thinks that this region might be made vastly productive and remunerative.

Iron Founding in California.—The *Scientific Press*, of San Francisco, says: The Etna Iron Works, Pendergast & Smith, proprietors, make an exhibit in the line of iron castings, which, though a single piece, is of a shape probably the most difficult our founders have to deal with. It is a large propeller for the steamer Ajax, and weighs 10,600 pounds. It is 14 feet in diameter, being the largest in size and weight ever cast on this coast. This is the fifth one of this pattern built for the Ajax. In running up the coast the steamer meets a good many large logs which get away from the numerous mills up there, and she has in each case broken her propeller by coming in contact with these logs. These ironworks make a specialty of propeller casting, having on hand patterns for fourteen different sizes. The large one referred to is set up so as to be revolved slowly, and several other smaller sized propellers are within the railing on the floor. In the same exhibit are a number of patterns of ornamental ironwork for house fronts. The Etna Iron Works also make a specialty of this class of work, orders for which have greatly increased of late years among us. The designs shown are very handsome and much more ornamental than can be made durable in wood. A great variety of these designs is kept on hand, and of course new ones are made to order. Altogether the display is quite creditable, and if the example of the Etna had been followed by more of our foundrymen the general public would have been more favorably impressed with the extent of our iron manufacturing resources.

In Ohio there are 50 railroads, exclusive of the narrow-gauge roads, eight of which did not pay their running expenses during the year 1875. Thirteen paid no interest on their bonded indebtedness. Seven are in the hands of receivers. The gross receipts of these roads for 1876 amounted to $34,119,049, while the operating expenses were $24,404,565, leaving $9,714,484. The total cost of these roads, including all debts, was $317,222,232, showing that the net earnings are a trifle over 3 per cent. of the invested capital. The total bonded indebtedness of these roads is $160,000,000, all of which bears 6 per cent. interest or more, so that the net earnings will not be sufficient to pay the interest on the bonded debt leaving nothing for the millions invested by stockholders, of which there are 17,000. If this is the result of railroad investment in Ohio, the leading State in agricultural products, with growing manufacturing enterprises and coal and iron in abundance, what must be the condition of railroad property in less populous and favored States?

The thanks of the public are due to a Mr. Shaw, who has invented a nozzle which will allow steam to blow off without making a deafening roar and a nuisance for miles round. It operates by breaking the waves of sound, the escaping steam being surrounded with a wire helix. A report adopted by the Committee on Science and Arts of the Franklin Institute says: "In view of the annoyance, fright and danger arising from the the roar of escaping steam, and of the completeness with which the nozzle destroys this roar, we are of the opinion that Mr. Shaw has done a great service to the community, and especially to the transportation interests, in overcoming an obnoxious and dangerous feature in the use of steam; and we recommend the award to him of the Scott legacy premium and medal for his spiral exhaust nozzle."

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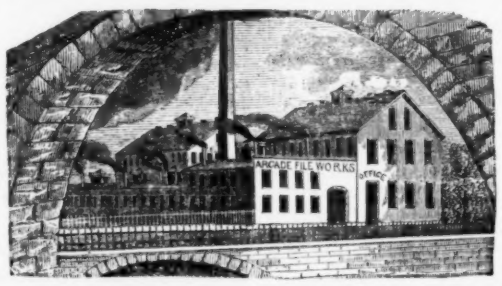

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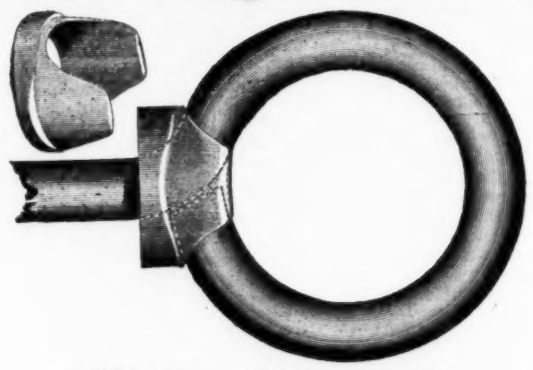

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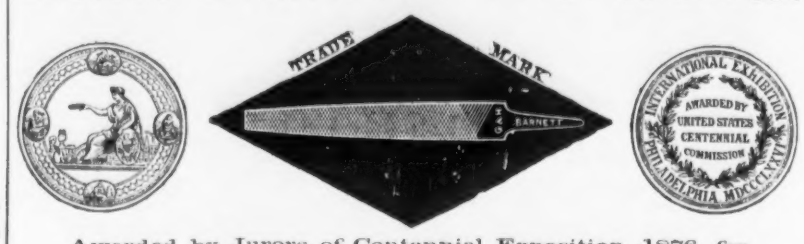

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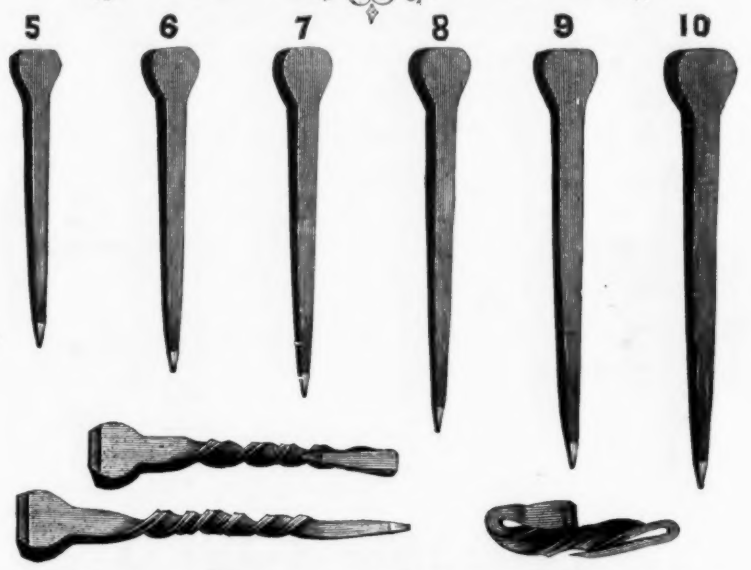

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Incrustation in Steam Boilers.

BY STEPHEN ROPER.

There is no mystery connected with the prevention of scale in steam boilers, as six minerals, viz., sulphate of lime, phosphate of lime, carbonate of lime, magnesia, silica, and alumina, form the basis of all scale and incrustation, and any ingredient or compound that will neutralize these salts and prevent them from forming into a hard glassy scale on the parts of the boiler most exposed to the fire, until they can be blown or washed out, will do all that can possibly be accomplished in this connection, as while it is retained in the shape of soft slush, or sludge, there is not much danger of the plates being burned through.

One of the substances most extensively employed for the prevention and removal of scale in steam boilers, as well as one of the most simple, effective, and cheap, is carbonate of soda—the soda of commerce. White ash, or soda ash, being cheaper, is often used instead, but is less effective; besides, it is easily adulterated, and is very seldom found pure. Soda is found to act well in preventing and removing incrustations, consisting as it does of both sulphate of lime and carbonate of lime. The manner in which the soda and the sulphate in the water react on each other is readily understood. These two salts exchange their acids, the results being the formation of sulphate of soda, which is very soluble, and carbonate of lime, which, being absent from any carbonic acid in excess, is insoluble, and precipitates without forming a hard incrustation.

Soda does not act injuriously on the boiler plates, unless the salt is concentrated from want of sufficient blowing off, or unless the soda itself is impure and contains acid. The belief entertained by many in its injurious action has in many cases arisen from the following cause: In boilers fed with water containing corrosive impurities, together with matters that form a thick incrustation the danger done by the former is in time to a great extent prevented, and sometimes altogether concealed by the scale formed. On employing soda, and particularly caustic soda, to remove the incrustation, the defects in the plates, whose presence may not even be suspected, become exposed, and being attacked anew by the acids in the water used for washing out the boiler, which are not neutralized by the soda, are caused to "bleed." This gives them the appearance of having been recently formed, and their presence is at once set down to the action of the soda. Sal soda, when introduced into new or clean boilers free from scale or incrustation, has a tendency to impart an oily or soapy coating to the surface of the iron, and when this is attained there is rarely any trouble arising from scale, whatever may be the character of the water. This goes to show that to prevent boilers from becoming coated with scale, the solvent must be applied when they are new or just after they are thoroughly cleaned.

Another valuable property of soda is its power of neutralizing the free acids so often found in the purest waters used for boiler feeding, as well as in those containing larger quantities of impurities, and which are the direct cause of pitting and other forms of corrosion. The introduction of about half a pound of soda per day into an ordinary large-sized boiler is generally found sufficient to prevent, or at least to greatly mitigate any corrosive action. The well-known property soda has of dissolving and removing grease, which constitutes one of its chief values when used for domestic purposes, renders it very useful in overcoming the difficulty often caused by the presence of grease in steam boilers. The foaming up of the water is increased by the addition of soda when grease is present. This, if allowed to take place to any great extent, is liable to give trouble by priming, and again, on this account a scumming apparatus or surface blow-out should be used whenever soda is used with greasy water.

Catechu, nutgalls and other astringents containing tannic acid have been found effective in preventing and removing incrustation. The tannic acid decomposes the lime salts and forms tannate of lime, which is insoluble at first, and forms a scum, which should be removed by surface blowing off. The remaining soluble constituents should also be blown off frequently, as their concentration is liable to tell severely on the iron, unless the acids be neutralized by sufficient alkaline substances purposely introduced.

Hemlock, oak, logwood and mahogany sawdust are frequently used for the prevention of scales with very satisfactory results, as the tannic acid which these woods contain has a tendency to mix with the scale-forming ingredients, to render them more light and porous, and consequently to prevent them from forming in hard, solid masses. The sawdust and bark of these woods have no chemical action on the iron of the boilers, but only tend to preserve it. It is very common to find boilers located on streams in the vicinity of saw mills entirely free from scale. In fact, refuse logwood, mahogany, or oak sawdust, sal soda, ash and yellow ochre form the base for nearly all the patent compounds and solutions now in use for preventing and removing scale from steam boilers, coloring matter being added for the purpose of preventing steam users and engineers from discovering the ingredients from which they are made.

The following receipt will be found to contain the ingredients most generally used for preventing the formation of scale, and may be relied upon as the most safe, simple and efficient remedy now in use: 100 pounds of refuse logwood, mahogany or oak sawdust; 20 pounds of sal soda; 10 pounds of yellow ochre. The sawdust to be dry, mixed with the sal soda and ochre, and ground in a burr mill to the consistency of shorts used as horse feed. It may then be introduced once a week, in seven-pound charges, the first five weeks, and five-pound charges once a week afterward. It may be introduced either through the safety valve or man-hole, or the same ingredients may be placed in a tank or cistern, covered with water and allowed to remain for 48 hours, when it may be allowed to percolate or filter down into barrels, and be introduced through the pump in quantities of about three gallons per day, or it may be drawn off from the tank by a pump through a pipe attached for that purpose. The above ingredients, in the proportions given, will neutralize the water of mines, wells and rivers, and be sufficient to keep a large boiler free from scale for three months. It can be made up at a cost of about 50 cents, when the same quantity will cost $10 if purchased from parties engaged in the sale of anti-crustators or scale preventives.

The foregoing ingredients, when pulverized and pressed into metallic cans, are sold under the name of powders, and when coarsely ground and packed in boxes, kegs, barrels or sacks are termed a compound; when percolated or filtered and the liquor mixed with about 20 per cent. of rock or ground oil they are denominated anti-lamina fluid, or some such name; but whether called powder, compound or solution, the ingredients of which they are composed or compounded are nearly the same, the name and coloring stuff being intended to disguise the character of the ingredients of which they are composed. A fluid, very extensively sold for this purpose, is collected from the flume of a paper mill in Philadelphia, where paper is manufactured from wood. Compounds or powders, of whatever ingredients composed, are more dangerous than fluids or solutions, as the gum they contain has a tendency to stick safety and check valves on their seats; whereas, if percolated and held in suspension, the gum and gluten they contain more readily unite with the mineral ingredients in the water, and have no effect whatever on the valves or steam cylinder.

Such is the want of information on this subject that it is very common to find steam users and owners of steam boilers throwing away or allowing to go to waste the very same substance and ingredients that they are purchasing at a dear price from others, for the purpose of preventing and removing incrustations from their boilers. If such a state of ignorance and carelessness existed in relation to the care and management of any other class of machines, it would be a matter of surprise among intelligent people at the present day. But from the fact that more ignorant vagaries and stupidity always existed in relation to the care and management of the steam boiler, it is not to be wondered at that a good deal of it should exist in regard to this matter.

But even when the most efficient solvents are used it is necessary, at short intervals, to remove the accumulations from all accessible places by blowing out, washing, scraping, &c. If the water is allowed to remain in the boiler until cold before cleaning, a great portion of the accumulations may be removed by means of brooms and scrapers, or be washed out with hose; but if the boiler is blown out under pressure, and the scale allowed to bake on the surface of the different parts of the boiler, it will be found difficult, if not impossible, to remove it.

Petroleum has recently been successfully employed for the removal and prevention of scale in steam-boilers, also for the removal of deposits from water pipes where the water contains large quantities of lime. It has the effect of penetrating and rotting the scale, causing it to become porous and disengage itself from the surfaces to which it is attached. It is a very simple remedy and can be used in small quantities without any difficulty whatever, say about a quart every week for a twenty-five horse-power boiler, and in quantities more or less, according to the size of the boilers. It may be introduced in the feed-water or through the safety-valve, or in any way most convenient for that purpose; but to be effective it must be pure. The heavy oil used for lubricating purposes in cold situations is the most efficient, as the refined oil of this description is of no use, as it is soon expelled by the heat.

Zinc in different forms is frequently used as an anti-crustator in steam-boilers, but its action depends wholly on the character of the water; if it contains a sufficient amount of acid, a voltaic battery is formed between the iron of the boiler, the zinc, and the acid in the water; but if the water contains no acid, the zinc remains inert and has no effect whatever on the scale, but it never fails to inflict permanent injury on the boiler connections, pumps and steam cylinder. Such a contrivance for the removal of scale is very old, and for one instance in which it gives any relief it fails in a hundred others.

The Sutro Tunnel.—The progress of this gigantic work is now very rapid; in February it advanced 100 feet per week, but the average is only 94 feet. The whole length excavated is now nearly 17,000 feet; the rock is exceedingly hard, and 60 men are constantly at work. It is expected that they will soon reach the level just below the great silver mines, and then immense stores of wealth will be opened.

The London *Times* says that in July 114 sailing vessels and 10 steamships belonging to the United Kingdom and the Colonies were struck off the register. Of these 67 belonged to the Colonies, 2 to Sunderland, 4 to the port of Newcastle, 6 to Scotland, 3 to Yarmouth, 5 to Ireland, 9 to Liverpool, 7 to London, 5 to Wales, 2 to Whitby, 1 to Hull, 1 to the Channel Islands, and 7 to various minor ports of the West and South of England. Seventy-six had been built in the Colonies, 8 in Scotland, 7 in Sunderland, 2 at Low Walker, 1 at Southwold, 2 at Whitehaven, 2 in Ireland, 2 in Yarmouth and 1 at each of the following places, viz.: Blackwall, Guernsey, Isle of Man, Liverpool, Ulverston, Kingston-on-Hull, Ilfracombe, Glocester, Redbridge, Winsford, Weymouth, Southwick (Durham), Southampton, Shoreham, Bideford, Wells, Scarborough, Leftwich and Portmadoc. One was constructed so far back as 1756, 1 in 1788, 1 between 1800 and 1810, 4 between 1810 and 1820, 2 between 1820 and 1830, 4 between 1830 and 1840, 8 between 1840 and 1850, 29 between 1850 and 1860, 44 between 1860 and 1870, 25 between 1870 and 1877, and 5 at dates not ascertained. The causes assigned for closing the register were as follows: Sold to be broken up, 2; broken up, 26; sold foreign, 21; stranded, 3; lost, 18; abandoned, 3; missing, 8; wrecked, 16; burnt, 9; locally registered, 2; sunk by collision, 2; foundered, 3; sunk, 1; converted into lighters, 3; condemned by order of United State, Court, 1; sold by order of Admiralty Courts 3; and unseaworthy, 1.

Car for King Oscar of Norway.

From the Wellington *Republican* we take the following:

The Jackson & Sharp Company have just finished a narrow-gauge railroad car for King Oscar of Norway and Sweden, which for beauty and convenience is unequaled even by the one recently built by the same firm for Dom Pedro of Brazil, and exhibited at the Centennial. The car is built low to suit the numerous tunnels which occur among the mountain cliffs for which that country is noted, and is divided into three compartments. The smaller compartment is used for a toilet room and also contains the heating apparatus. It is elaborately finished and furnished with every convenience which would contribute to the hygienic requirements and comfort of the royal family.

At the opposite end of the car is a large compartment for the king and his suite. It is finished in princely style with chairs upholstered with plush. The middle and large compartment is the parlor and royal rooms, furnished with sofas, chairs, lounges and very finely finished tables. The upholstery is of sage green silk tapestry, and is undoubtedly among the finest specimens of workmanship ever sent out from this city. The woods of which the interior is finished are maple, walnut and satinwood veneering, to which a very brilliant polish is imparted by the most skillful artisans. The violet predominates in the various shades in which the ceiling is finished, and is in perfect harmony with the velvety Brussels which covers the floor.

Upon the paneling on the outside the coat-of-arms of Norway is artistically painted. It is represented by a guard shield of purple red, with a lion standing upright and a drawn halberd in his fore paw. The lion is finished in gold and the blade of the halberd is painted in a steel color. The whole is surmounted by a crown finished in purple and gold. Upon each side of the car is painted the name "Hamar Throndhjem Jernbane," which, we are informed, means Hamar Trondhjem Railway, the former being a town in Eastern Norway and the latter a town in Northern Norway. The finest plated glass is used, and that used in the inside doors is very chastely engraved.

The car has been carefully taken to pieces in sections, its respective parts carefully boxed up and put aboard the steamer for New York. At that city the car will be transferred to the steamer Suevia, of the Hamburg American Packet Company, and on the 13th inst. it was to start for its destination.

Light Steamers for African Rivers.—Messrs. Yarrow & Co., of Poplar, England, have received orders from Colonel Gordon, Governor-General of Upper Egypt, for the construction of four very light draught steel steamers, for use on Lake Albert Nyanza, and for opening up the navigation of the rivers in Central Africa. As these steamers will be carried on land on the backs of negroes, the builders have to subdivide the packages in such a manner that none shall exceed 200 lbs. in weight. It is estimated that no less than 4000 men will be employed for the porterage of these vessels. A new steamer has been designed and constructed for navigating the river Quanza by Messrs. Edwards & Symes, of Cubitt Town, London. She is named the Silva Americana, and is 140 feet long by 18 feet beam. She is propelled by oscillating paddle-wheel engines of 32 horse-power, which have been made by Messrs. J. Penn & Sons. She is built of iron and Siemens patent steel, and is fitted out in a very neat and very complete manner, almost like a yacht. She is fore and aft schooner rigged, fitted with a handsome saloon, and cabins on deck for passengers and crew, and has an awning deck above. The conditions of the contract were that the vessel should carry 20 tons of cargo on 24 inches of water, at a speed of 10.4 knots or 12 miles an hour. Upon her trial in the Thames she only drew 22 inches of water with 27 tons of cargo on board, her speed being 10.39 knots, a success which reflects great credit upon her builders. It is to be hoped that this boat will prove as useful an addition as she promises to the various means now in progress for developing the trade of the great African continent.

Boring for Water.—An interesting experiment is being made by the Stafford (England) Town Council, in order to obtain a good water supply for the town. By boring to a depth of about 600 feet, by means of the Diamond Rock boring process, they hope to penetrate the water-bearing rocks of the new red sandstone formation, which exists widely in Staffordshire, and in many places lies at an elevated level. A depth of 300 feet has already been bored. It was asserted by many eminent geologists that extensive beds of rock salt existed in the variegated marls above the bunter rocks. This opinion has been found to be correct, for a bed of rock salt, 40 feet in thickness, has been perforated, as well as various smaller veins; but the engineers find that the brine can be effectually "tubbed out" by means of iron lining tubes. A considerable length of time must necessarily elapse before the water-bearing rocks are entered.

The Duke of Bridgewater was fond of watching his men at work, and when they were boring for coal at Worsley he attended every morning and looked on for a long time together. The men did not like to leave off work while he remained there, and they became so dissatisfied at having to work so long beyond the hour at which the bell rang, that Brindley had difficulty in getting a sufficient number of hands to continue the boring. On inquiry he found out the cause, and told the duke, who from that time made a point of walking off when the bell rang, returning when the men had resumed work, and remaining with them usually until six o'clock. He observed, however, that, though the men dropped work promptly as the bell rang when he was not by, they were not so punctual in resuming work. He asked to know the reason, and the men's excuse was that, though they could always hear the clock when it struck twelve they could not so readily hear it when it struck only one. On this the duke had the mechanism of the clock altered so as to make it strike thirteen at one o'clock.

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Send for circular of illustrations and price lists.

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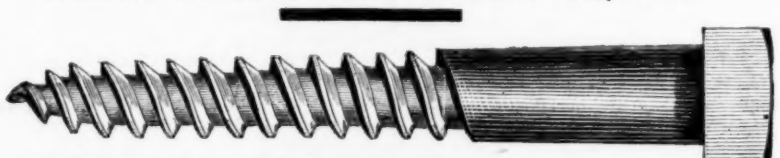

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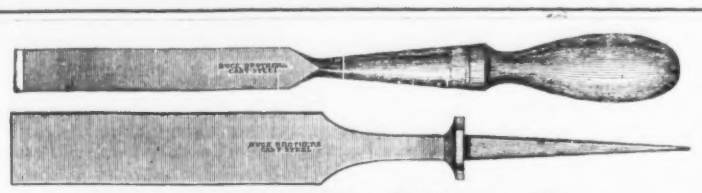

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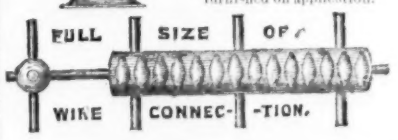

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The Iron Age.

New York, Thursday, September 20, 1877.

DAVID WILLIAMS - - - *Publisher and Proprietor.*
JAMES C. BAYLES - - - *Editor.*
JOHN S. KING - - - - - *Business Manager.*

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The American Hardware Company are our agents for Australia. They will exhibit files of *The Iron Age* in the American Building of the International Exhibition, at Sydney, N. S. W., where subscriptions will be received. After the close of the Exhibition, the files may be examined at, and orders for subscription directed to, their office in Melbourne. Sample copies will be mailed by them, free of charge, to any firm engaged in the trades we represent in Australia, Tasmania and New Zealand.

City subscribers will confer a favor upon the Publisher by reporting at this office any delinquency on the part of carriers in delivering *The Iron Age*; also, the loss of any papers for which the carriers are responsible. Our carriers are instructed to deliver paper only to persons authorized to receive them, and not to throw them in hall-ways or upon stairs; and it is our desire and intention to enforce this rule in every instance.

CONTENTS.

Our Share in Chilean Trade.

The Republic of Chili was governed as a Spanish province until the year 1810, when the people threw off the yoke of the mother country. In 1818, Chili was declared independent. It is in length about 1200 miles and from 100 to 200 miles wide, with an area of 197,468 square miles, without counting the disputed part of Patagonia. The population, which in 1843 counted 1,084,000 souls, had in 1875 increased to 2,068,424, including 26,528 foreigners. The country is divided into 17 provinces, and has 14 larger ports besides many minor ones.

In comparison with the Argentine Republic the increase of population has been slow, which is mainly to be attributed to the distance separating Chili from Europe and China. The fertility of the Chilean soil and its mineralogical productiveness, place the country at the head of its sisters on the Southern continent in point of desirableness for thrifty emigrants. The climate is mild and salubrious. Its proverbial freedom from revolution in contradistinction from the remaining Spanish-American countries, is another characteristic which recommends Chili to the emigrant. Yet the current of emigration to South America has been principally in the direction of the Argentine Republic.

If Chili has expanded but slowly in the number of its inhabitants, she has made marvellous strides in moral and material development. In 1844 Chili imported from abroad but $8,596,674 of goods, and exported $6,087,023. In 1851 the total trade with foreign countries had already doubled, or nearly so, being $28,031,363; in 1871 it had risen to $58,613,573, and in 1875 to $74,065,092. Direct and indirect taxes during the decennium 1831–1840, amounted to $21,083,341; in 1841–50 to $34.036,125; in 1851–60 to $60,343,315; and during the five years from 1871–75 to $72,550,817. Considering the magnitude of the income, the public debt is trifling; it has risen from $36,629,600 in 1871 to $50,677,600 in 1875. There are in operation 975 miles of railroad and 3284 of telegraph. Tramways have also been extensively introduced in Santiago and Valparaiso, conveying in 1875 18,000,000 passengers.

The principal productions of Chili are wheat, flour, barley, hides, wool, wine, copper, silver and some coal. In manufacturing the country has also made some progress, especially in cloth, silk and paper. Chilean banks possess a paid-in capital of $20,000,000.

In 1832 only 275 merchant vessels entered the leading port, Valparaiso; in 1873, 989 sailing vessels and 596 steamers entered, with an aggregate tonnage of 973,190; in 1875, 928 and 467 respectively, aggregating 861,687 tons.

Compared with neighboring ports, Valparaiso occupied the second rank in point of arrivals in 1873, so far as the tonnage is concerned:

	Vessels.	Tons.
Callao, entries	1,637	1,093,226
Valparaiso, entries	1,585	973,190
Montevideo, "	1,673	885,453
Guayaquil, "	215	162,855

Most of the Chilean ports are distinguished by a considerable trade movement, as the following departures in 1873 will show:

	Tons.
Valparaiso	963,075
Coquimbo	693,819
Caldera	567,770
Coronel	346,060
Chanaral	333,659
Carrizal Bajo	330,811
Huasco	245,763
Tome	156,619
Talcahuano	133,261
Valdivia	83,211
Ancud	78,792
Constitucion	51,742
Melipulli	34,394
Total	4,018.976

Valparaiso, it will be seen, represented but 24 per cent. The foregoing tonnage was conveyed under the various flags as follows:

	Tons.
English	2,800,290
French	145,268
German	77,290
Other European nations	66,495
	3,089,343
Spanish-American and Polynesian	808,371
American	121,262
Total	4,018,976

The Europeans, it will be noticed, represent 77 per cent. of the whole—we represent but 3 per cent. The Chileans themselves and remaining nations make up the balance.

The Chilean consulate of this city kindly furnishes us the following statistics of export, in thousands of dollars, gold:

	1873.	1875.
To England	19,398	21,033
France	1,194	3,007
Germany	483	928
Belgium	81	2
	21,156	24,970
Spanish America and Brazil.	14,132	9,742
Other countries	1,644	1,798
	36,922	36,510
United States	1,888	418
Total	38,810	36,928

European percentage in 1873, 55; in 1875, 67; American, 5 and 1, the balance being absorbed by Peru and Bolivia principally.

The Chilean imports in 1872, 1873, 1874 and 1875 were, in thousands of dollars:

England	66,881
France	29,531
Germany	14,865
Belgium	3,148
Spain	1,267
Italy	1,038
Other European nations	971
	117,701
Spanish America and Brazil	22,632
Asiatic countries	859
	141,192
United States	7,950
Total	149,142

The average European share during the quadrennial period was 79 per cent.; American, 5½ per cent.; Peru, Bolivia, the Argentine Republic and remaining countries, 15½ per cent.

Small as our share is, it is well to examine what we are in the habit of sending to our most distant sister republic. According to our home statistics, Chili received from the United States during the fiscal year ended June 30, 1876, of domestic productions:

Agricultural implements	$88,075
Flour	11,605
Railroad cars	174,975
Cotton goods	490,330
Drugs	44,759
Manufactures of hemp	10,265
" iron	271,313
Petroleum	84,416
Beef	14,414
Pork	5,367
Lard	105,728
Sewing machines	17,444
Spirits of turpentine	5,398
Refined sugar	453,523
Tobacco	32,201
Manufactures of tobacco	9,545
Lumber	82,026
Staves	5,969
Furniture	67,621
Woodenware	25,208
Total	2,000,182

The foregoing shows that Chili is as civilized as any country on the globe, and already takes from us quite a variety of goods; but compared with what the European nations furnish her, the amount of American goods taken is trifling.

It has furthermore to be considered that in this Chilean trade, California and Oregon have their share; the Atlantic States are, consequently, reduced to a small share in this traffic with a nation which is more flourishing than any other on this continent, is never subject to violent political disturbances, and therefore as desirable a customer as Brazil or Australia. Yet we have allowed the Europeans, as in many other cases, to do the bulk of both the export and import trade, although they are geographically much further away than we are, and in spite of the fact that comparatively few Europeans have settled in Chili.

The Prospect of the Fall Trade in Iron.

With the arrival of the last half of September we reach a time when we are in a position to judge with some certainty the prospect of the fall trade in iron and nails. The representatives have made their early fall trip and returned with their reports, or have sent in accounts sufficiently full to enable their principals to judge of the outlook. The crops are generally so far advanced as to be beyond the reach of ordinary casualties, and this gives us a key to the purchasing power of the great agricultural districts of the country, as well as an idea of the probable demand for transportation and the resultant demand for railroad supplies, which consume such a large proportion of the iron manufactures.

In general it may be said that the prospects for trade are very good, but the reports indicate that it will be late in coming and will continue later into the winter than usual. The reports from the South and those parts of the West and Northwest that have not been scourged with the grasshoppers, are very favorable. The Indian famine and the drain on Egypt for troops will make a short cotton supply from those countries, while in the South the crop is large. The people of that section, under the new order of political affairs, are taking heart and embarking in enterprises and making improvements that the unsettled state of affairs heretofore has not justified. This will create a considerable demand for iron. The South also is beginning to work. The people are coming to realize that a race of consumers only impoverishes a section. One of the ablest of the Confederate generals told us but a short time since that the laziness of the better class of Southern whites was the curse of the South; that he was determined his children should work, and his boys are all learning trades.

In the grasshopper districts the crops of this year will free most of the farmers from debt and leave a surplus for improvements and renewal of implements, while in the other regions the abundant crops will make money plenty and lead to expenditures that will create a demand for iron. The crops, however, are so large that there will be no time to spare for anything but harvest work until all is safe, and, consequently, it will be late before they are harvested and taken care of or sold and shipped and the value in hand, and this will make a late demand for goods.

Stocks are light, both in dealers' and manufacturers' hands. A prominent Western nail manufacturer stated to us only last week that he never knew the stocks of nails to be so small in the West as at this time. Most of the mills at Wheeling and Pittsburgh were idle during the months of July and August, and at the ruling prices they do not care to run. Nearly all are again in operation, but unless better prices are obtained some will stop by the 1st of October. In iron the stocks of good, bad and indifferent are somewhat larger, but by no means large.

In the East the regulation of the production of nails has kept the stocks down, and many of the mills have been idle all summer. The Southern market will make large demands, and the stocks there are very light. It is also true that there are not so many nails coming from the West into the Eastern market as there were some months ago.

Regarding the stocks of iron East, our advices are not definite enough to enable us to speak with certainty.

In regard to prices, it would seem that in iron they have touched the lowest point and that better quotations will rule. Some of the strongest firms in the West have refused longer to meet the prices that competition, caused by the necessities of some mills, have forced upon them, and they are to-day refusing orders at figures they would have met a month ago. This will reduce the volume of their trade, but it will entail no loss. Cheap iron will continue to be made, but it will prove to be dear iron when made; for good quality, merchants and consumers may conclude they must pay a good price.

The Weakening Power of Trades Unionism.

Indications are not wanting that the power of trades unions is being broken. They are not only losing their control over those who, as members, have placed themselves under their guidance, but they no longer inspire respect among those who are not members, but who have been forced by practices that are too well known to follow the dictates of these unions as to the terms on which they shall labor and the prices they shall demand. Already in Western Pennsylvania an organization of those who will no longer obey the various unions has been formed for mutual protection, and its membership, which is rapidly increasing, express a determination to sustain each other in the exercise of their individual rights, which they claim have too long been usurped by miners' and boilers' unions and similar associations. The miners employed by the Waverly Coal and Coke Company, near Pittsburgh, have publicly announced that they do not and will not recognize the right of any trade union to bind them, make any scale of prices to govern them, or in any way abridge their right to make their own bargains to sell their labor to whom and for what they please. That this is not merely a local and temporary disaffection, is evident from the smothered mutterings and the unconcealed discontent that is manifested by the members all over the country at the failure of the unions to redeem the promises made to those who have struck at their direction. The case of the engineers of the Reading Railroad is one in point. These men were promised by the Brotherhood $60 per month if they would refuse the offers of the road. The complaints are constant that the pledge has not been kept, and seeing the folly of their course they are now abandoning the Brotherhood and seeking their old situations.

Another reason of this rebellion against the unions is the fact that they have not lately been successful in the strikes they have organized. During the "flush times," when work was begging for workers, almost any demand of the unions was acceded to; but it is different now. Workers are begging for work, and with this changed relation strikes have been almost uniformly failures. The men see that the unions do not, as formerly, compel obedience to their demands, and they are questioning whether they cannot do better for themselves than the union can do for them.

Again, when wages are low and work scarce, the best workman is the one that is retained and his less skilled fellow is the one that has to go. The latter sees that uniform wages is what has cost him his situation, and will keep him out of it, and he is asking if it will not be better for him to labor for 10 per cent. less and have work than to consent to no reduction and have no work. He soon tires of the platitudes of the unionist who prates of the harm done his fellow by taking the 10 per cent. reduction, and thinks of the injury he is doing himself in not taking it; and knowing that he has no hope of work so long as he demands the same wages for his inferior work, he will soon forswear allegiance to the union that compels him to this course.

Another fact is having more weight than all these combined. The excesses committed in the name of labor during the late insurrection have opened the eyes of many of the steady, sober, thinking men among the trades union laborers to the logical outcome of the teachings of these unions. For a while, under the guidance of their communistic leaders, their conception of *meum* and *tuum* had become decidedly blunted, and many an honest man really believed that corporations and capitalists, from the simple fact that they had and controlled money, were thieves of the blackest character, and labor would be justified in violently recovering from them the money which, according to these leaders, had been coined from the sweat of the brow of unrequited labor. It needed the breaking up of the great deeps to show these men their error; but for them a new dispensation will date from the wreck of that week in July.

We would not, however, in all this be understood as intimating that trades unionism is a thing of the past, or that its power has wholly departed; but we do believe that there is to be, for a while at least, more independent action among workingmen, a less blind and slavish following of the dictates of trades unions and a growing belief that, after all, independence of action and its consequent manliness and incentive to effort, is most conducive to success.

The Position of the Lead Market.

Since our last discussion of the lead market some three months since, prices have continued to decline both in Europe and this country. The main cause of this uninterruptedly downward course of the metal is to be found in the largely increased output both in Spain and the United States. Since the pacification of the Peninsula the mineralogical resources of that part of the world have developed again on a vast scale, especially the production of Lead.

During the early months of the year the war demand which had sprung up in Russia and Turkey was sufficiently active to absorb available supplies, including this excess of Spanish exportation, but when the belligerents ceased to buy, the trade demand proved too slack to take up the rapidly accumulating surplus in England, France and Germany, to which countries Spanish lead had been shipped in increasing quantities, in view of the contemplated export duty resorted to by the Spanish government as a measure of financial necessity.

In this country it had been hoped that the decline in the price of lead would cause producers in Missouri, Utah and Colorado to curtail their output, but, for reasons best known to themselves, whatever curtailment was resorted to has been merely temporary, the supply from those sources proving largely in excess of immediate wants during summer. A decline has, therefore, been precipitated, and prices have fallen to a figure much lower than would have been deemed probable, or even possible, a few months ago.

Consumption has by no means come up to expectations, and this is particularly the case as regards white lead, the mainstay of the lead market. Comparatively little building, plumbing and painting seems to have been going on in the country while real estate remains so prostrate. The demand for shot during the past six weeks has, however, been fair, but this is a comparatively less important item, and not sufficient to exercise much influence while consumers and dealers hold respectable stocks. Speculation in the spring was followed by such ruinous results that there has been none since that time, and the metal, so far as present appearances go, seems bound to decline to the export point; this has already been reached on the Pacific coast.

Whether the Chinese can use American lead to as good advantage for tea-box lining and other purposes, as they can English, Spanish and German, experience will show. If they can, as we are inclined to believe, this lead export from San Francisco to China would prove a great boon to our lead mining industry on the Western slope of the Rocky mountains. At a certain price the Chinese consume all metals in large quantities. This has of late years been shown with respect to quicksilver and tin, for which China has now become a great market. Should these anticipations be realized with reference to lead, it would be another proof that markets abroad are not wanting if we can produce an article cheap enough. If, then, the lead mines can make a living profit at export rates, which has yet to be shown, there would be no impediment to increasing their production as much as they deem advisable. With a gradual revival in the domestic demand, lead would then be placed on a sounder footing than has been the case during the past twelve months. Meanwhile the continuation of the war in Europe has since yesterday already led to a rebound, and trade there also becoming brisker, the time may not be distant when lead will return to the price it commanded on the other side in the spring.

The Board of Trade returns in England and France for the first seven months of the years named give the following figures:

ENGLAND—LEAD IMPORT AND EXPORT.—TONS.

Import.			Export.		
1877.	1876.	1875.	1877.	1876.	1875.
58,039	45,691	45,411	23,235	20,061	17,532

FRANCE—LEAD IMPORT.—TONS.

	1877.	1876.	1875.
Ore	13,111	7,875	6,757
Pig Lead	25,335	23,697	22,879

From this it will be seen that there have been imported of pig lead alone into both countries 83,374 tons, against 69,388 in 1876, and 68,290 during the corresponding period of 1875; an increase this year of 20 per cent. Meanwhile the import of ore into France has doubled in two years.

In former years, with a war in Europe, an easy money market would have induced speculators to operate largely in lead, but speculation seems to have forsaken this metal there as much as it has here, and we shall have to wait for the legitimate influence of supply and demand to regulate the price on both sides of the Atlantic.

The Lake Superior Ore Supply.

The Marquette *Mining Journal* says:

The Iron Age can suppress its apparent anxiety concerning the increased production of our mines. The output of the present season will not be as large as that of 1876, notwithstanding there has been an increase up to this time, as compared with a corresponding period of last year.

We have no anxiety on the subject. Indeed, we are rather hopeful that there will be an increased production. We do not believe that the Lake Superior ore mines have borne their proper proportion of the reduction in the cost of materials for making a ton of pig iron, and should welcome an overstock as a means of a greater reduction. But the *Mining Journal* to the contrary notwithstanding, the indications all are that there

will be an increase—if not in actual tonnage, in the proportion of the supply to the demand. If the demand is not as great as last year, while the supply remains the same, there is an increase, and the appearance of the docks at Cleveland indicates an oversupply. It is almost an impossibility to get dockage for ore coming down, and with an increase in shipments of 112,163 gross tons up to September 12th, there is certainly a fair prospect of somewhat of an overstock.

Tests of Chain Cables.

Letter from Commander L. A. Beardslee, U. S. N.

To the Editor of The Iron Age—DEAR SIR: Through the courtesy of Mr. H. L. Fearing, of Boston, I have been furnished with an editorial clipped from your paper, the matter of which so nearly concerns myself that I feel it both a duty and a privilege to write to you to heartily indorse the views expressed, and to supply you with such data as will justify you to yourself and others for the faith that you have exhibited, without due evidence, in the work of and results obtained by the United States Board appointed to test iron and steel, of which I am a member, and chairman of the committee to which has been assigned the investigations in regard to chains, cables, &c.

Your editorial is in the issue of August 16th, and defends the work of the board against the attacks of an anonymous critic who, in the columns of a "scientific paper" ridicules the results, not because they are wrong, but simply because they differ in some points from results hitherto attained, or assumed.

I have since procured a copy of the "scientific" paper referred to, and have read the witty but not wise attack, and would esteem it a favor if you will permit me the use of your columns to answer this criticism, which I will quote:

"Another instance: We have before us a letter from a very eminent experimenter upon the strength of metals, &c. He informs us that by his recent investigations, involving an immense number of experiments, the report of which before many months will be made public, the deductions of Rankine and other authorities as to the strength of chain are wholly wrong; that the stud does not increase the strength of the links, and the strongest links are not made from the strongest bars, besides some other startling deductions. Theoretically at least, then, all our chain cables have been made under erroneous rules; practically, however, they have served their purpose," &c.

The previous "instances" criticised but not disproved being the works of W. R. Kuller and Dr. Weyrauch, I have to reply but to the criticism quoted, and before doing so must be allowed to express surprise that a private letter from myself to an "eminent" engineer should coincide so exactly with several of the phrases quoted that I am compelled to recognize myself in the "eminent experimenter" referred to. The vein of sarcasm which pervades the whole article, however, makes the assumption of the title less a trial to my modesty. The "eminent" engineer had written to me to contribute an article on cables, tests, &c., to a work which he was editing. In my reply I regretted to be compelled to decline, and gave two reasons for doing so. The first was that my data on the subject was the property of the United States Board, which had expended all of the funds it could spare from the limited purse at its disposal in the research, and the second was that the results found by us, by actual experiments, in many instances differed so widely from the general views on such subjects that I did not feel it was safe to announce them, without at the same time backing them up by unquestionable data of facts, and the space afforded by an encyclopedia article would probably prove insufficient for the purpose. I offered, in conclusion, that if the consent of the president and members of our board could be obtained, to supply a few results. My answer to this offer I find in the editorial which is in the *Scientific American*, July 21. My views as regards the expediency or propriety of anticipating the report of the committee remain the same, but as the criticism has brought two of "the startling deductions" prominently forward, I feel that it will be in place to correct, if possible, any mischievous effect which the article might produce.

I will first notice a misquotation. Although my letter was not copied, I feel very sure that I did not say that "the deductions of Rankine and other authorities were wholly wrong." I did say (if I did not I say so now) that there are wrong deductions among them.

First, in regard to the action of the stud. All English authorities unite in the assertion that its introduction adds to the strength of a link, and I am glad to have so "eminent" an American engineer place himself so squarely on record as indorsing this view. It will not be necessary to bring any theory to oppose fact in order to set this question at rest, for our records of the rupture of many cable links made of iron of all grades demonstrate that in every instance where a studded link and an open link are at the same time subjected to tension, it is the studded link that breaks. And if from the same bar studded and open links are prepared, the record of the ultimate strength of the latter, as found by test, is in every case above that of the former by from 5 to 15 per cent.

These facts obtained, there is but a little thinking necessary to procure a theory which shall account for them. A link is a bar of iron bent to an oval form and the ends welded. When this link is subjected to tension in direction of its longitudinal axis, the first tendency after its elastic limit is passed is to close laterally. The strain upon the fiber of the iron is relieved by the amount absorbed in the process of closing, until at last the link, having assumed its strongest form, viz., the two sides parallel, and separated but by the diameter of the wire, there is no longer a relief by change of form of the made-up article, but the change must take place among the atoms, and the iron yields to a stress nearly equal to that which would be required to rupture simultaneously two bars of iron. The rupture is in the direction of the fibers which pull apart. The introduction of a comparatively incompressible obstacle prevents this closure, and the sides of the link borne down over the sharp, hard edge of the stud are cut and weakened, and subjected to a modification of the stress, which is resolved into a pressure at right angles to the grain.

It seems but natural to expect that this leverage should have some effect, and that it does our records of strength of links supply sufficient evidence. But although the results thus differ from those of Rankine and others, neither they nor we are necessarily wrong. There is a marked difference between the comparitive strength of studded and open links, due to the character of the iron from which they are made. Open links made from "soft" ductile iron are fully 15 per cent. stronger than studded ones, where the iron is coarse and hard; but with good power to resist steady stress the difference between the two varieties lowers to from 3 to 6 per cent. And in this we find a reason why both sets of experiments may, although differing, be right; and it shows too that it is not entirely safe to depend upon rules and formulas deduced from the action of foreign metals in attempting to judge of our own.

The English use for cable bolts iron, the tensile strength of which is required to be equal to 60,000 pounds per square inch; and for a stud they use malleable iron. Their cables will resist great steady strains, but "practically" many of them, especially of the larger sizes, have been broken by sudden strains. Notably those of the frigate which brought home from India His Royal Highness the Prince of Wales.

We use iron of less tensile strength and a cast iron stud. The percentages of difference we have found lead us to believe that were the cables experimented upon by Rankine and ourselves similar, we would probably have procured similar results. But as under existing circumstances the results do differ, it is well enough to know it and the reason why.

The next "startling deduction" is that "the strongest links are not made from the strongest bars." A moment's reflection will show that the link, a manufactured article, which has had its original inherent strength modified by reheating, bending and welding, must depend for its strength upon the capacity of the iron from which it is made to resist the deteriorating effects, if any exist, of these processes.

The strongest bars are those which either through excess of carbon, copper or some other constituents have great tenacity, at the expense of either welding and working qualities, or they are from ores free from these ingredients, but which receive, during the process of rolling, so much "work" that the subsequent forging detracts from a certain part of the bar a part of its strength.

Our results, stated briefly, show that among the points to be avoided in the selection of chain iron is the *high tensile strength*, whatever may be the cause which produces it. We have instances of competitive tests of too pure refined irons, in bar and cable form: One with a strength of 60,000 pounds to the square inch, the other with but 53,000 pounds when tested as bars. As cables, the latter in every test yielded higher results than the former, and we have much confirmation of this experiment.

It is probable that among the "startling deductions" criticised, the critic includes the assertion in my letter to the effect that we had succeeded in establishing definitely, or at least sufficiently so for practical purposes, that there exists a relationship between the strength and other properties of the round bar and those of the link made from it, which is so fixed that the simple and comparatively inexpensive test by tension of a test piece one-half inch in diameter from a bar of any iron will furnish data which, properly understood, will be a basis upon which the strength of a link or links made from that bar can be as closely estimated as the strength of one set of links can be by the test to destruction of others of the same iron and size.

Further, that from the strength developed by a bar of any diameter of a uniform homogeneous iron, the strength of bars of any given diameter of the same iron can be closely ascertained, tables having been prepared by which the variation in proportional strength due to variation in diameter can be ascertained and allowed for; and that by the combination of these tables with the data of others which give the percentage of the strength of the bar generally developed by links made from it, the strength of links of any diameter of wire can be closely predicated from the rupture by tension of a small test piece.

FOR EXAMPLE.

Bar 2" diam. T. St. 48,000 lbs. per sq. in. ult. str. bar 150,816 lbs.

Strength of links (according to character of iron as shown by reduction of area, elongation, appearance of fracture, &c.) from 160 % to 175 % of strength of bar.

At tensile strength of 48,000 lbs., probably about 170 %=256,387 lbs. strength of links.

Bar 1⅛" same iron, probable tensile strength 54,000 lbs. per sq. in., ult. strength bar 53,676, of which 170 %=91,250 lbs. strength of links.

We find that a remarkably large percentage of the links made of suitable iron develops a wonderful uniformity of percentage of the bar's strength, and in almost every case where there is a discrepancy we can find the reason why by our notes.

There are, however, certain grades of iron which will not develop higher than from 120 to 140 per cent. of the bar's strength. These are generally defective either through excess of tensile strength, or through "red short" qualities, which have insured their injury during manufacture.

The remaining "somewhat startling deductions" are in each case quite susceptible of proof, and it is hoped that the efforts which have been made to prove or disprove theories by the aid of facts, will in due time divest the work of the committee of any claim to be ranked as the "theoretical dicta" of anyone.

The report in question contains the record of the stress required to rupture by different forms of force over a thousand bars of iron, made by different manufacturers, and by different processes, and of all sizes from 4 in. to ¼ in., with full details of the varying action under the stress, thus giving facts, not theories. From the bars a great number of links have been made, and the history of their action under stress furnishes another set of facts. The combination of these two sets of facts has presented certain ratios and proportions, and given basis for theories which can be compared with the facts from which they originated, and it is considered that evidence enough will be presented to sustain the assertion that "practically chain cables have (*not*) in all cases served their purpose"—that they have in many cases been made from iron the strength of which, through the use of an erroneously shaped test piece, has been greatly overrated, and that in selecting the strongest bar from which to make the link, an "erroneous rule" has prevailed. And of more importance than all, perhaps, that many finished cables have been seriously injured by the use of the proving strain of the British Admiralty; strains which too high on all sizes are irregular in their proportion to the strength of the various sizes, testing by way of proof a 2" cable to nearly 70 per cent. of its ultimate strength, and a 1" cable to much less, but still too high. For this table another, which has been calculated from the results actually obtained, is furnished.

In short, the report referred to is a compendium of much work, and it can be hardly fair that it should be subjected to adverse criticism until the critic has had an opportunity of finding out somewhat of the nature of that which he presumes to condemn.

Yours truly,
L. A. BEARDSLEE,
Com. U. S. N. and Member U. S. Board.

The Outlook for the Iron Trade.

FIFTH PAPER.

The present condition and future prospects of American rolling mills demand very grave consideration. Many millions of dollars are invested in this branch of business, and the fate of these millions, carrying with it that of whole communities, requires the utmost caution and accuracy in the attempt to form conclusions. Brief reference to some of the figures embodied in the satisfactory report of Mr. Swank, of the American Iron and Steel Association, for 1876 may not be uninteresting.

At the close of 1876 there were "338 rolling mills, containing 4488 single puddling furnaces (each double furnace being counted two single furnaces), with an annual capacity of over 4,000,000 net tons."

The total product of rolled iron in 1876, including iron and steel rails, was 1,921,730 tons, against 1,941,992 tons in 1872 and 1,966,445 tons in 1873, the year of largest production.

The total of rolled iron outside of rails was 1,042,101, or 100,000 tons more than in 1872, when the price of the best refined bar iron at Philadelphia averaged the year through $97.63 per ton, and only 34,000 tons less than in 1873, when the same iron averaged $86.43. We imported in tons:

	1872.	1876.
Pig iron	295,967	83,092
Bar iron	89,576	26,652
Iron rails	381,064	287
Steel rails	149,786	....
Old iron and scrap	278,257	14,149
Miscellaneous	29,494	3,765
Total	1,224,144	127,925

From these figures we see that practically foreign products have been excluded, while the American production has remained substantially the same, yet the price has been steadily falling until the iron quoted above as at $83.43 in 1873 averaged only $52.08 in 1876, or $2.58 lower than the lowest price ever before reached, viz., $54.66 in 1851, and in May of the present year it fell to $45.25, the lowest figure in the history of the trade.

Great reductions, both in the prices of labor and materials, have taken place from time to time, but nevertheless it is a fact, only too well known to most manufacturers, that for many months past business has been conducted not only without profit, but oftentimes with positive loss. The careful figures of Mr. W. E. S. Baker, in *The Iron Age* of July 5, lead to the latter conclusion. That he fully appreciates the gravity of the position is evidenced by the following extracts: "The whole iron industry seems to be approaching a dangerous crisis, which may result in unexpected and almost irreparable disaster. While the present product exceeds the consumption and the price obtained is below actual cost, a decided and immediate decrease in the production seems to be the only practicable remedy."

But can such a remedy be applied? We think that Mr. Baker, in a single sentence, shows the impossibility when he says: "Furnace and rolling-mill owners are unwilling or unable to suspend operations, but continue to make and throw iron upon a demoralized market, vainly hoping that their average cost for the year will not exceed the average of their sales, until the sheriff exposes their defective financiering."

There are comparatively few men who have the nerve to cut short their losses. With the positive knowledge that they are losing, they nevertheless hope against hope that something will turn up to change the scale in their favor. Nor is this to be wondered at. Many have pulled through mere commercial crises before. Engrossed with present cares they have neither the time nor inclination to stop to examine whether any cause other than that of a general business depression is working against them. At first unwilling, the time comes when they are unable, to stop; their capital impaired and their credit taxed to the utmost, their only hope lies in "bridging" until better times come, and so they go on spending more than a new dollar to make an old dollar good; their only hope for a market is in cutting under current rates, and in the vain struggle for existence they are largely instrumental in bringing about their own eventual ruin. While weaker concerns are pursuing this suicidal course, the stronger ones, conscious of their superior strength and naturally unwilling to lose the trade secured by many years of honorable exertion, are compelled to meet this fatal competition, and so the fight goes on until the weaker succumbs, leaving the other almost conquered by his own victory.

The history of the last seven years especially shows that all combinations for the regulating of prices by limiting production have failed, and a careful study of the laws of trade inevitably lead to the conclusion that all such attempts must and will fail where large numbers and wide areas are concerned.

Years ago a combination of pig iron makers was attempted without the faintest approximation to success. For years the bar iron manufacturers have regularly assembled and established a card, only to find that before they had fairly gotten to their homes some one outside of the organization, or some unscrupulous member in it, had "cut under" the rates agreed upon.

The breaking up of the late coal combination is the most striking of all failures, as the paucity of numbers and magnitude of interests would seem to have warranted success if success were possible.

We do not see how any successful plan for limiting production can be devised. On the contrary, there seems to be good reasons for thinking that causes are operating to add to the capacity of the country, even faster than the sheriff can strike off those mills that are now upon the roll.

Of late years there has been steady progress in the direction of increasing the product and decreasing the cost by the adoption of new processes and improved machinery. To thinking men it has become painfully evident that the cost of turning pig iron into the finished product is entirely too high, that the cost of and quantity of the fuel used is excessive, and that some method must be devised to substitute mechanical for hand puddling. The long, repeated and bitter fights between mill owners and puddlers has kept the trade in perpetual turmoil and uncertainty. Without entering at all upon the question as to whether the puddlers can and ought to be contented with less wages, the fact remains that the American mill owner cannot afford to pay $4.50 to $5 per ton and successfully compete with the foreign manufacturer, who only pays 10/ to 12/ for the same work. Another fact must not be overlooked, viz., that the product of mechanical puddling is better than hand puddling, irrespective of lower cost, and this of itself is of prime importance, when we take into consideration the work that modern engineering is calling into existence. That some form of mechanical puddling is to be the process of the future is as certain as that the sun shines, and whether its introduction be slow or speedy the result is the same—death to the mills of the past. Local demands may in many instances delay this consummation, but it will only delay, since the cheaper product, even if manufactured at a distance, through the ever increasing facilities of transportation will take possession of the more remote markets of the country. Conceding that reconstruction will take place, it must necessarily be under given conditions.

The objection made in England to the introduction of mechanical puddlers was that it rendered worthless existing plants. The whole machinery is so different from what it has been that you cannot remodel, you must rebuild, and this too at heavy cost. Hence only parties already strongly established or those able to command large capital can stay in the race.

Is it not reasonable to suppose that the future iron industry will centralize around certain favorable points, and that mammoth establishments will arise at the expense of existing smaller and scattered works? If we are satisfied that such is the tendency of the times, will it be possible to effect any combination to raise prices or limit production? To apply a common but forcible Americanism, "Will not the longest pole bring down the most persimmons?"

We may bewail the present unfortunate condition of things; we may cry aloud that there are too many in the business, and already too large an output; we may denounce as folly or insanity any new investment in furnaces or mills, but it will avail nothing to prevent people from going into new enterprises if they think they can see a profit.

A fitting example of this comes to us across the waters. The condition of the iron and steel trade is fully as bad, if not worse, in Great Britain as in the United States. Furnaces are out of blast by scores, mills have shut down, coal and ore mines have stopped, thousands of workmen are idle and a fierce competition by French and Belgian steel makers meets the British iron master at every turn. With an acknowledged capacity far beyond home needs, and with foreign markets gradually closing against them, one would naturally imagine that capital, abundant and cheap as it is there, would hesitate before going into new ventures; yet we are advised that Bolckow, Vaughn & Co., so well known for the magnitude of their undertakings, are erecting at Eston Junction, in the North of England, a magnificent steel plant, "to comprise seven high-blast furnaces and eight converters, capable of producing steel rails and plates in quantity equal to 2000 tons per week," not to utilize home ores, but ores from Bilbao, Spain.

Men are reasoning differently now than at any previous time in the history of the trade. If they have even a moderate share of experience and intelligence they can see that the day of excessive profits in the iron and steel business has gone by. A fair, legitimate, moderate return for the capital invested is all that can be hoped for, and to secure this the best methods must be adopted, the most favorable locations secured, an ample investment of capital made, and the utmost economy and closest business management exercised. Under these conditions, even, the return must come in the shape of a small profit on a large product, and it is upon this basis that the prudent man will figure.

He plainly sees that iron and steel is a necessity of the age; it is absolutely certain that the demand will never be less than it is to-day, but that, on the contrary, it will steadily increase. The country now requires, as a minimum, 2,000,000 tons of rolled iron and steel per annum, and the control of this magnificent business is swinging on one

[*Continued on next page.*]

single point, that of the lowest cost of making. It is doubtful whether there is a single large concern in the United States that does not fully appreciate this, and whose managers are not earnestly and exhaustively studying how they can secure it. The best proof of this is in the anxiety with which every new process is investigated and tested, oftentimes at large and fruitless expense; every demonstrated improvement adopted, and every new district putting forth superior claims examined.

While a wail of despair comes up from certain sections, we see remarkable activity in others. That capital cannot be and is not depressed by the present unfavorable condition of the trade is evidenced by the building of a dozen furnaces in Ohio in a single year; the erection of furnaces, mills and steel plants in the Southern States with not only American but with foreign money; the enlargement and improvement of furnaces in certain localities both East and West; and, most significant of all, the erection of additional Danks mechanical puddling furnaces, as improved by Mr. Williams, superintendent of Graff, Bennett & Co.'s works, Pittsburgh.

Is it possible to curb or suppress such activity by any combination? Is it not part and parcel of a great natural irresistible movement, which, bringing perchance distress and ruin to individuals, is nevertheless to benefit the nation at large?

Is it not wiser and better to look at this matter full in the face than, ostrich like, to bury our heads in the sand and foolishly imagine that our whole bodies are protected?

We do not think we err greatly in summing up as follows: Old time machinery, wherever situated, must go to the scrap pile. Modern mills with fairly available machinery, but unfavorably located, must be transferred to more favorable positions associated with those owning blast furnaces, and the whole run under one strong, efficient administration. Just in proportion as this action is delayed will the labors and perquisites of the sheriff be increased. By such action tem porary relief will come, and a present trade may be retained to serve as a basis for that further improvement and enlargement that the times imperatively demand. Such reorganized concerns will have to meet as competitors those already well established and constantly introducing new improvements, and both in time will find dangerous rivals in new combinations of capital securing cheap and valuable mineral properties—building at low cost new plants embracing all the best results of the highest skill and the world's experience and producing standard products at minimum cost. It may very justly be said that the last competition will come slowly, as it is a difficult matter, even in ordinary times, and especially in this country, to get men of ample means to expend so large an amount as such a scheme requires. It is fortunate that it is so, for a too ready extension in this direction would produce such a rapid sweeping away of values as to increase tenfold the present distress.

The point we make is this: that improvement and extension will come to a sufficient degree to prevent any material advance upon present prices, and that any one now manufacturing without profit, or at a loss, cannot reasonably hope that the future will bring him financial salvation.

It may be said that the views above advanced are unnecessarily radical and unwarranted at this time. Time will show whether they be correct or fallacious. At all events, the issues involved are pregnant with momentous consequences, not only to the owners of existing works and their creditors, but to the capital of the country at large, and the sooner that clear and satisfactory conclusions are reached the better it will be for all concerned.

In another paper attention will be called to certain modern improvements which seem destined to exercise a marked influence upon, if not to largely revolutionize, the manufacture of iron and steel in the United States.

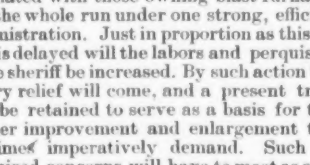
EDMUND C. PECHIN.

CLEVELAND, Ohio.

New Patents.

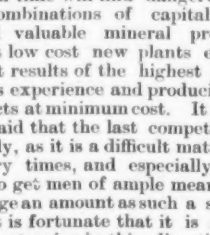
We take the following abstract of new patents, recently issued, from the official record:

BLANK FOR SHIFTING RAILS OF CARRIAGES.



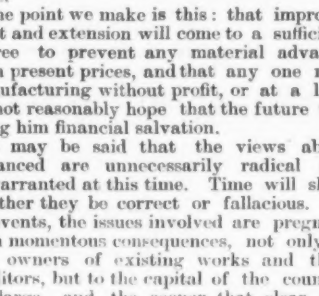
To E. D. Clapp and F. Van Patten, Auburn, N. Y.—Aug. 21.—As a new article of manufacture, the forging, consisting of bar A, having lugs B and E.

BLANK FOR SHIFTING RAILS OF CARRIAGES.



To E. D. Clapp and F. Van Patten, Auburn, N. Y.—Aug. 21.—As a new article of manufacture, the forging, consisting of the prop-holder iron A, having the lugs B and C.

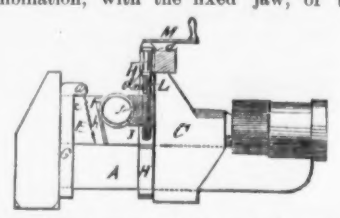
FURNACE DOOR.



To Jas. Spinks, Pittsburg, Pa.—Aug. 21.—The combination, specifically, of the casting A and casting B, the latter having the lug *b* and the horizontal connecting bolt or bolts *d*.

PIPE AND NUT WRENCH WITH CUTTER.

To B. L. Walker, Sing Sing, N. Y.—Aug. 21.—1. In a wrench constructed with a fixed jaw B, and a movable jaw C, the combination, with the fixed jaw, of the



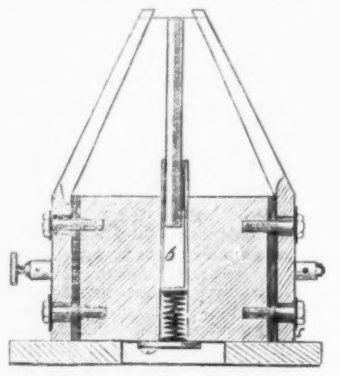
wedge-shaped griper-block and the spring-strap G, having the turned down ends *a*, and embracing the said block and the bar A, and holding the griper-block in the relation to the bar and fixed jaw, the said griper-block constructed to have a longitudinally-sliding movement on the strap G.

2. The combination of the sliding and griping-cutter carrier E, carrying the cutter F, strap G, frame H, carrying the grooved sliding support I, feed-screw L, having bearing K, and winch M.

ELECTRIC CANDLE.

To W. E. Sawyer, New York, N. Y.—1. The method of obtaining an electric light, consisting in heating a refractory substance by bringing it in contact with a heated conductor of electricity.

2. An electric candle, in which a conductor of electricity, heated to any desired



degree of intensity, renders luminous a non-conducting substance in contact therewith, as set forth.

3. An electric candle, in which the circuit producing the light is entirely metallic, in combination with a substance which is rendered luminous by heating.

4. An electric candle, in which the light is produced by the direct action of the electric current upon its conductor, in combination with a clay, lime, or other refractory substance, substantially as shown and described.

5. In an electric candle, the combination, with a refractory substance, rendered luminous by heat, of apparatus for forcing the same to a constant bearing against a heated conductor, substantially as shown and described.

194,396.—*Riveting Machine.*—J. F. Allen, New York, N. Y.—Aug. 21.

Depressions in the face of the hammer at right angles to its narrow striking surfaces allow the metal of the rivet-head to spread when struck. The narrow striking surfaces act upon each part of the rivet, in virtue of the continued turning of the hammer by the mechanism specified in the first claim, and eventually produce the finished head. An adjustable foot, provided with a steady-pin, which enters one of the rivet holes, supports the machine upon the work, and the machine is connected to the anvil block by a bolt, that passes through one of the rivet holes and into a slotted arm projecting from the said anvil block.

194,393.—*Horse Shoe Nail Machines.*—H. E. Woodford, Montreal, Quebec, Canada.—Aug. 21.

The disk carrying the graduated rolls for drawing the nail-blank is also provided with a projection on its periphery for operating the cutters, which, at the proper time, are brought in position to sever the blank. One cutter is fixed in the side of the anvil, the other to a pivoted arm connected with the anvil, with which said arm advances and recedes, bringing its cutter in position to act, and again withdrawing it from the path of the graduated rolls.

194,464.—*Machine for Making Horse Shoe Nails.*—D. I. Pruner, McVeytown, Pa.—Aug. 21.

Die rollers form the rod into a series of connected (heads and points) blanks. Emery wheels remove all irregularities left by the forming process, and a shear co-operating with a stationary bed die trims and points each nail, and severs it from the rod. A pawl, operated by the shear-carrying plunger, feeds the rod forward. A V-shaped plate, backed by a spring, acts to discharge a nail that adheres to the shearing die.

194,469.—*Screw-Cutting Tap and Die.*—John Schaub, Allegheny, Pa., assignor to himself, J. C. Reymer and J. H. Rhine.—Aug. 21.

The tops of the threads of alternate sections are removed, so as to lead and cut the width of the thread, while the succeeding sections finish the cut by deepening the groove.

The following trade-marks were registered during the week ending Aug. 21:

5051.—*Prepared Paints.*—Heath & Milligan, Chicago, Ill.

"The word 'Best,' printed, (upon a ground of any desired description) in red, with large letters, open or skeleton, along the central portion of a label to which it is applied, the name of the particular kind of paint contained in the package being printed over it in smaller black letters, all as shown."

5080.—*Vehicles and Vehicle Springs.*—William W. Grier, Hulton, Pa.

"The word-symbol 'Dexter.'"

The Pennsylvania Railroad Company's elevator at Pittsburgh, which was burned by the strikers, is to be replaced by a new one. This will be 40x120 feet and 60 feet high. The capacity will be about 100,000 bushels, one-fifth of that of the one destroyed. It will cost about $40,000.

N. &. G. TAYLOR CO., Philadelphia.

TIN PLATE.

We have the LARGEST Square Sheet of Tin Plate ever made, 144 inches long by 48 inches wide.

ALSO,

The SMALLEST Sheet of Tin Plate ever made, 6 inches wide by 10 inches long.

Between these extreme sizes we have open for inspection our immense stock of odd and regular sizes of Tin Plates of all grades, qualities and thicknesses, ranging from number 38 to numbes 12 gauges.

In addition to the above—and our assortment of special Patterns, Splayed Boiler Sheets, Milk Pan Tin, Stove Door Lining Plates, etc.—we always carry in large stock,

CIRCLES of Every Description,

From 6 Inches to 40 Inches, IC to 8X Thickness, No. 30 to No. 20 Gauge, 3 Ounces to 30 Pounds Weight.

These are all stamped out, by correct dies, from the very finest quality of Charcoal Plates, and afterward tinned.
Send for our illustrated catalogue, descriptive circulars and price lists.

When desiring any information on Tin Plate, it will be to your advantage to write us.

N. & G. TAYLOR CO., Philadelphia.

CROSSLEY'S

Patent Stave Jointer.

The most Simple, Durable and Perfect Jointer made. In four sizes, jointing from 16 to 46 inches in length. In use from Maine to California. Is used by the largest stave and barrel manufacturers in the world. Will pay for itself in 90 days in saving of time and timber over any Saw Jointer ever used. Send for circular to.

H. A. CROSSLEY,

78 Columbus St., Cleveland O.

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MANUFACTURERS OF

Brass, Galvanized and Ship Chandlery

HARDWARE.

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WILSON BOHANNAN,

Manufacturer of Patent

BRASS

Pad Locks,

FOR

Railroad Switches, Freight Cars,

AND THE HARDWARE TRADE

All sizes, with Brass and Steel Keys, with and without chains.

PASSENGER CAR LOCKS,

Bronzed, Nickel-Plated and Japanned.

BROOKLYN, N. Y.

☞ Catalogues and Samples sent upon application.

ROMER & CO.,

Established 1837. Manufacturers of Patent Scandinavian or Jail Locks. Brass Pad Locks for Railroads and Switches. Also, Patent Stationary R. R. Car Door Locks. Patent Piano and Sewing Machine Locks.
141 to 145 Railroad Avenue, NEWARK, N. J.
Illustrated Catalogue sent on application

The Patent Automatic Stokers

which were shown by Dillwyn Smith at the Centennial Exhibition in the British section, and obtained the medal and highest award, are now offered to the users of steam in the United States, by the "United States Automatic Stoker Co.," under a license from Dillwyn Smith, for use on land boilers, with full confidence that the satisfactory results obtained in Great Britain and on the Continent of Europe (where over 1200 of them are in use), will be fully realized here. Some of these results are: The generation of from 25 per cent. and upward of steam from a given grate surface above what is obtained from the same quality of fuel fed by hand. The lessening of the cost of steam from 10 to 30 per cent. from being able with the Stokers to properly burn a lower priced fuel. The entire removal of the smoke nuisance. The lessening of the labor of the fireman. Their use also materially reduces the temperature of the fire room and also prevents the injury to the boiler caused by the contraction and expansion of the plates resulting from the frequent opening of the fire doors in hand firing. These and other advantages have secured their introduction into the boilers of many of the largest Mills and Iron Works in England and other countries, and we are now turning out an average of 10 machines per week. A few letters are given from some of those having them in use, the statements in which can be implicitly relied upon. For information respecting price, &c., apply to

THE UNITED STATES AUTOMATIC STOKER CO.,

DILLWYN SMITH, President, 2 Chestnut St., Philadelphia.

Or ISAAC COLLINS, Secretary.

LAND MACHINES,

From A. M. Collins, Son & Co.'s Factory, Third and Canal Streets, Philadelphia.

April, 3, 1877.

DILLWYN SMITH, Esq.—*Dear Sir:* After several months' experience with your Automatic Stokers, we take pleasure in stating that they have proved entirely satisfactory to us. The saving in *cost* of fuel we estimate at 20 per cent., increased amount of steam fully 30 per cent., beside giving us a *very regular supply*, the variation not being appreciable on steam gauge. Hoping you may be successful in introducing them into general use in this country, we remain

Yours, truly, A. M. COLLINS, SON & Co.

Wigan Coal and Iron Company.

Wigan, September 29, 1875.

Dear Sirs: I have pleasure in certifying that the Stokers applied to our boilers at Kirkless have worked to our satisfaction, and have effected a saving in fuel. Be good enough to put in hand six more for the range of boilers at our Alexandria Pit.

I remain, yours, truly, W. H. HEWLETT.

From J. R. Jones, Esq., Afonwen Paper Mills, Holywell.

Your Stokers answer my purpose; without them I could not have obtained that regular supply of steam throughout the day. I formerly used coals; with the Stoker I use slack, and save fully 25 per cent. in cost of fuel. They are suitable for all boilers.

The Earl of Dudley's Round Oak Works,

Birmingham, 6th March, 1876.

I have much pleasure in stating that the Stokers you have fixed at these Works are giving most satisfactory results. The first you put down convinced me that we could use it for burning the fine siftings or dust from the slack; and those you have since erected have fully confirmed me in that opinion, for not only do we now use the siftings we could not previously burn at all, but the generation of steam is so rapid that we have discontinued using one of the boilers, finding we can obtain, by the aid of your Machine, quite as much steam from three boilers as we previously could from the four.

Yours, truly, R. SMITH CARSON.

Hurst Mills, Ashton-under-Lyne,

20th September, 1875.

Dear Sirs: We have had your Patent Mechanical Stokers in our use for some time, and find they work to our entire satisfaction, and effect a considerable saving in coal. Yours, respectfully,

CLDHAM WHITTAKER & SONS,
Per W. THORP.

Note.—They have ten double Machines at Work.

Moore's Anti-Friction Parlor Door Hangers,

Moore's Anti-Friction Sliding Door Sheaves,

Moore's Anti-Friction Baggage Car Door Hangers,

"CLIMAX" BARN DOOR HANGERS,

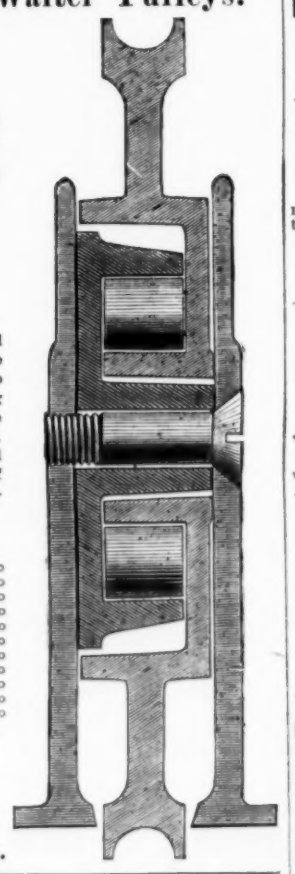
"ACME" BARN DOOR ROLLERS,

Moore's Anti-Friction Dumb Waiter Pulleys.

MANUFACTURED BY

S. H. & E. Y. MOORE

CHICAGO, ILL.



The sectional cut on the right shows Moore's Anti-Friction Bearings as applied to the Sliding Door Sheaves, Parlor Door Hangers and Dumb Waiter Pulleys. The cup which contains the rollers is clamped by the screw firmly between the two sides of the shell. The hub of the wheel revolves within the rollers, the bearing being upon the upper rollers. The hub of the wheel and the inside rim of the cup are turned true in a lathe. The rollers are also turned and are case hardened. These bearings are easy and noiseless in operation, and have great strength and durability. They require no oiling. The same principle holds in the bearings of the "Climax" and "Acme." The frame of the Parlor Door Hanger is of malleable iron and very stiff.

PRICE LIST.

"Climax," No. 1, Extra Large and Heavy	per doz. pairs,	$24.00
" No. 2, Standard Size	" "	15.00
" No. 3, for Light Doors	" "	12.50
"Acme," 8 inch wheel	" "	18.00
" 6 " "	" "	15.00
Moore's Anti-Friction Sliding Door Sheaves, 4 inch	per set of 4,	4.00
" " " " " 5 "	" " 4,	5.00
" " Parlor Door Hangers, 5 "	" " 4,	7.50
" " Dumb Waiter Pulleys, 3 "	" " 4,	2.50
" " " " 4 "	" " 4,	3.60
" " Baggage Car Door Hangers, 3 inch	per pair,	1.50

Discount to the trade. Send for catalogue.

For Sale by the Hardware Trade Generally.

S. H. & E. Y. MOORE,

68 Lake Street, CHICAGO, ILL.

LEECHBURG IRON WORKS.

KIRKPATRICK, BEALE & CO.

Manufacturers of all grades of

FINE SHEET IRONS,

(Refined, Cold Rolled, Show Card, Stamping, Tea Tray, Polished, Shovel.)

TIN AND TERNE PLATES, made with Natural Gas as fuel.

OFFICE: No. 116 Water St., Pittsburgh Pa. WORKS Leechburg, Pa.

JACOB FOOSE,

Lancaster, Pa.

TRADE MARK.

Manufacturer of

Copper Kettles,

And all kinds of Copper work, from 2 to 50 gallons P. S.—Send for price

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KNOX AND IMPROVED KNOX FLUTING MACHINES.

8 in., $4 50; 6 in., $3·00; 4 in., $2·50.
Extra Rollers.—8 in., $2·25; 6 in., $1·50; 4 in., $1·25.
Flutes.—10, 12, 15, 18, 21, 24, 27 & 30, less discount.—

H. SAUERBIER'S SONS,
40 & 42 Mechanic St., Newark, N.

A. A. IRVINE,

Comminuted Glues.

Samples and price list free to responsible parties.

BALDWIN'S

Premium Mangle

Guaranteed to perfectly perform all work. Either steam or hand power. Cold or steam heated Rolls. Cheap, durable, highly recommended.

National Home for Disabled Vol. Soldiers, Eastern Branch,
TOGUS, ME., August 4, 1877.

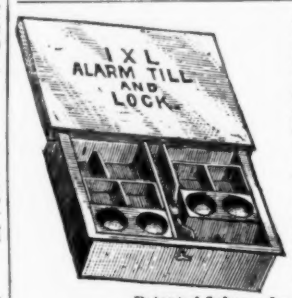
Standard Laundry Machinery Co.—GENTLEMEN: It gives me pleasure to state that one of your "Baldwin Steam Mangles" has been used in our laundry for several months, and has thus far given *entire satisfaction, being simple, well made and easily run.*

Yours, truly, WM. S. TILTON, Dep. Gov.

For circulars apply to

Standard Laundry Machinery Co.,

32 Dey Street, New York. 58 Long Wharf, Boston.



This Drawer has sixteen compartments. For efficiency, durability and convenience it is proved to be superior to any in the market, while it has this advantage over all others, that any one using a common drawer can attach our lock to it in a few moments. It is a common lock—when set, a combination lock—and is also an alarm lock.

Patented July 31, 1877.

For sale at all the principal Hardware Houses in New York and elsewhere, also in the Manufacturer's Office, *24 Dey St., New York.* Price Lists furnished to the trade only.

HUGH W. ADAMS,

Iron Commission Merchant.

RAILWAY, PIG AND SCRAP IRON.

56 Pine Street, N. Y.

AGENT,

Millerstown Iron Co.'s Foundry Pig Iron. Grove Bros. Columbia Furnaces, Foundry and Forge Pig Irons. Eureka Iron Co.'s (Detroit, Mich.) Lake Superior Charcoal Pig Iron.

STEARNS MFG. CO.,

ERIE, PA., Manufacturers of

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Steel Castings,

Light and heavy **Steel Castings** of superior metal, solid and homogeneous. All work guaranteed. Send for circular.

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LEFFERT'S ENAMEL WORKS,

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Signs, Door, Number and Finger plates enameled in any color and decorated in any style.
Illustrated Catalogues furnished on application.
Plumbers' Materials, and every description of Wrought and Cast Iron Work enameled to order.

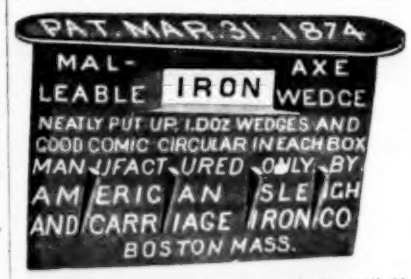
SAUSAGE MEAT CHOPPERS.

Kinyon's Patent, the "BOSS,"

3 Power Sizes, *4 Hand Sizes.*

KINYON BROS.,

Raritan, N. J.



Price, $4·80 per gross; one sample by mail, 10 cents; one each size (three sizes) by mail, 20 cents. one dozen by mail, 60 cents. For sale by wholesale dealers in Boston, New York, Philadelphia, Chicago and St. Louis.

Harvesting Machines.

BY EDWARD A. UEHLING, M. E.

(Continued.)

All the force necessary to overcome the resistances described, except 1 and 2, must be transmitted through the driving wheel or wheels, and is therefore dependent on their adhesion to the ground. The sum of these resistances does not fall far from 60 per cent. of the total effort, the remaining 40 per cent. being consumed in the transport of the machine through the grain or grass.

Trials to determine the draught under very unfavorable circumstances have, to our knowledge, never been made, but, judging from observation, the total resistance under such conditions often rises to double that given as results of dinamometer trials. Thus the maximum resistance to be met with in practice would be about 480 pounds for reapers and 360 pounds for mowers; allowing 40 per cent. for the transport of the machine, there remains 288 pounds for reapers and 216 pounds for mowers to be transmitted to the mechanism through the driving wheels.

Professor Thurston, in his paper on "The Past and Future of Road Locomotives," gives 28 per cent. as the coefficient of adhesion of smooth wheels upon a macadamized road, as found by actual trial. Taking 30 per cent. as the maximum coefficient of adhesion of the driving wheels of harvesting machines, which is certainly all they are capable of transmitting, considering them as smooth faced, we find 960 pounds for reapers and 720 pounds for mowers as the minimum load on the driving wheels to insure sufficient driving capacity.

All manufacturers of harvesting machines have resorted to a simple expedient for rendering the driving wheels more effective, consisting of moderately long rectangular projections, with which the rims are provided. For reapers but little is gained, since in soft and mellow soils these projections can add but slightly to the resistance of the wheel against slipping, having in its favor only the difference between the adhesive force of earth to earth and earth to iron, which in some soils, under certain conditions, may even result in favor of the latter.

A soil consisting of heavy loam and also some varieties of black soil, in a tolerably wet condition, will adhere so strongly to the periphery of the wheels as to hide the projections entirely. On dry and compact soils the aid of the projection is but rarely if ever wanted; doing work only in making impressions in the ground, they necessarily add to the resistance of transport. Thus it appears that, on the whole, for reapers this expedient is rather an objection than an advantage; a few of the manufacturers seem to have come to the same conclusion, and are now commencing to build machines with smooth-faced driving wheels.

For mowers, on the contrary, the periphrical projections are of great importance; entering the sod, which, even when quite wet, offers considerable lateral resistance, they become quite effective in preventing slipping. With the aid of this expedient mowers can be constructed of minimum weight without great danger of rendering their driving capacity uncertain. The majority of the American mowing machines would be ineffective with smooth-faced driving wheels on account of their extreme lightness.

In all machines whose wheel base is exactly or nearly a straight line, proper balancing is of the greatest importance. The weight should be so distributed that after the driver has taken his seat the load on the necks of the draught animals shall be a minimum. Machines having a linear wheel base have the advantage of compactness, of being easily manipulated and of having the least weight carried by wheels not calculated to aid in driving the mechanism; their disadvantage is that they are generally more subject to side draught and that a perfect balance is obtained only with great difficulty. Some builders whose machines are not well balanced endeavor to annihilate the load on the necks of the draught animals by lowering the point of application of the tractive force, causing the vertical component of the pull to counteract the weight otherwise to be sustained at the end of the pole, maintaining that in this way they relieve the horses of every weight on their necks, whereas, in fact, the only difference between having the hitching point below or above the pole is, that in the former case the force necessary to equilibrate the machine is transmitted through the whiffletrees and traces to the horses' necks, while in the latter it goes by way of the pole and neck yoke, the effect on the animals being the same in either case. Machines having a polygonal wheel base have an advantage over the former as regards balancing, and more liberties may be taken in the distribution of the parts. The pole being jointed to the frame, the animals have never more than half its weight bearing on their necks. On the other hand they have many disadvantages, having much ineffective weight, being less compact and generally more difficult to manipulate. The extra wheels are necessarily caster wheels (unless a truck be employed, which is still more awkward), and always give trouble on hillsides, guiding the machine either up or down grade, according as to whether the caster wheel is placed forward or in rear of the body of the machine.

Ready means for adjusting the machines to the proper hight for cutting grain or grass under various conditions, as well as to pass over obstacles without delay or danger to the machine, is of paramount importance.

Mowers always have the finger-bar joined to the frame, and are by this means rendered, to a great degree, self-adjusting; the cutter continually conforming to the ground, is free enough to glide over moderate undulations and sink into shallow depressions, thus cutting to the best advantage, without any special attention on the part of the driver. This alone however would not be sufficient, and therefore all modern machines have within convenient reach of the driver, one or more levers by means of which he can manipulate the cutter instantly whenever occasion requires. In all well-designed machines the levers are arranged so that the finger-bar can be raised bodily, or either end of it, at pleasure; besides this it should be provided with a lever for giving it a tilting motion, without which the machine cannot always cut to the best advantage.

For reapers, the best mode of manipulation is somewhat different. Single reapers do not require the cutter-bar to be jointed, and they are therefore always built with the latter rigidly connected to the main frame, generally forming a part thereof. The range through which the cutter of a reaper should be capable of being raised and lowered ought not to be less than 18 inches, the lower limit being quite close to the ground. Nearly all machines with a linear wheel base are manipulated by rotation about an axis through the grain and driving-wheel. Those having a polygonal base are rotated about an axis through the grain-wheel and parallel to the cutter-bar. Both of these modes of manipulation have a tilting effect upon the cutter-bar and platform. Some machines rely entirely upon this rotary motion for adjustment, and consequently the extreme positions are very unfavorable to the delivering of the grain, which requires the machine to be so placed in order to properly cut it. The gavels of short grain, in consequence of the great elevation of the rear end of the platform, drop on end and scatter, while those of long straw are jammed, for reasons obviously directly opposite. The majority of the machines, however, can be set to any hight that suits the conditions of the field to be cut, the range of adjustment by rotation being the same for every "setting" of the body of the machine. In the permanent adjustment, the whole body of the machine being elevated or depressed, as the case may require, the range of adjustment by rotation is not required to be so great, and hence the objection noticed above is partially obviated.

Machines allowing of permanent adjustment, as well as momentary manipulation, have, notwithstanding their preference, great defects not experienced in the use of the former. The machine being once adjusted, cannot be altered without stopping it, and in most machines not without trouble and considerable loss of time. This may occasionally become quite inconvenient, when the grain in a field varies very considerably in hight, it becoming necessary to adjust the machine to the smallest size, and thus cut the tall part of the crop lower than may be desirable.

In order to be perfect, the manipulating gear should be such as to be able to elevate or depress the cutter-bar and platform, bodily, to any hight required while the machine is in motion, and in addition have a certain amount of tilting motion. But there are practical difficulties in the way, which prevent such a mode of manipulation from being successfully introduced. Owing to the weight to be raised it becomes ponderosome and requires considerable exertion on the part of the driver to make the required adjustment promptly. Manipulating by tilting, on the contrary, is very easily effected, and if the machine is well balanced it can be adjusted with a slight expenditure of muscular power.

For nearly half a century from the time of Pitt's machine, the attention of inventors was almost entirely directed toward the perfection of rotary cutters, consisting of discs and various systems of knives, fixed in pairs or in greater numbers to revolving vertical axes Knives attached to endless belts or chains running around horizontal sheaves were also invented in a variety of forms. All of these,* along with a great multitude of complex reciprocating cutters, are now only regarded as mechanical curiosities.

Although the invention of the reciprocating cutter is with propriety attributed to Mr. Ogle (1822), it was not until Mr. Hussey (1833) embodied it into his machine along with other equally important principles, that machine cutting was crowned with success.

The modern cutting mechanism consists essentially of three parts:

1st. *The Knife or Sickle*—Consisting of a slender rectangular bar of iron or steel, to which is riveted triangular knife blades having either a smooth or a serrated edge. The former are known as grass, the latter as grain sections. The grain section, if correctly made, is always obtuse-angled. Its only advantage is that it will remain effective until it is worn out or broken. Its disadvantage is that it always requires more power than the smooth-edged section when the latter is in good condition, and that it can be used efficiently only in quite ripe and dry grain. The smooth-edged section is always acute-angled—generally an equilateral triangle with the corners truncated. Accurate experiments have, to our knowledge, not yet been made to determine the effect of the inclination of the cutting edges, but about 60 deg. works well, and that has been satisfactory to all parties materially concerned. The grass section has the advantage that it works well under all conditions as long as it is kept sharp, and the disadvantage that it requires to be sharpened quite often.

2d. *The Guard Fingers.*—The office of these is not so much to guard the cutter against injury, as the name would imply, as to render the latter effective. They are firmly bolted to the cutter bar. Their distance apart depends upon the dimensions of the knife sections, varying from 2½ to 4 inches, but 3 inches seems to be the figure to which builders are now approaching. It combines good practical results with perhaps the least cost. Guard fingers should combine great stiffness with a high modulus of rupture. Resilience, as a result of ductility, is of much less importance than a high elastic limit. Consequently that material which offers the greatest resistance before distorsion takes place is best suited for guard fingers. As a rule it is better the guard should break than bend out of shape, for it is generally cheaper to insert a new one than to rectify one that has been distorted, and for this reason cast iron is preferable to wrought iron. As is obvious from the principle of cutting, which resembles that of shears, it is of the greatest importance to have that part of the guards against which the sections cut, a sharp corner. In cast iron and wrought iron guards, and even those made of mild steel, the edge wears away quite rapidly, and the knife, unless very sharp, becomes inefficient. To remedy this many builders insert a steel plate which can be taken out and sharpened or renewed as often as required.

3d. *The Crank and Connecting Rod.*—These are almost universally employed in transforming the rotary motion of the driving wheels into the rapidly-reciprocating motion of the sickle. Many devices have been proposed and tried to take the place of the crank and connecting rod, but there is to our knowledge as yet but one which, in our estimation, has sufficient merit to compare favorably with the former. (The movement we just referred to is employed in the "Haymaker" mower.)

Owing to the rapid motion and exposure to dust and grit, the crank, as well as the joint at the sickle head, wear very rapidly, and having once started, continue at a vastly increasing rate, and unless the best care is taken from the beginning, a few days suffice to make it serious. In consequence of this wear frequent breakages of the sickle occur, which is jerked in two by the sudden change of motion caused by too much play in the joints. Although nearly all builders have devised means for tightening these joints, there still remains much to be done before the adjustments can be made quite satisfactory.

The crank and connecting rod are subject to still another defect, which appears to some extent in nearly all reapers, and cannot well be entirely obviated in mowers: It consists of the oblique thrust of the crank, caused by the fact that the crank shaft is always more or less elevated above the plane in which the sickle reciprocates. The energy wasted by the obliquity of the thrust of the connecting rod can very easily be calculated, it being equal to the total thrust multiplied by the sine of the angle made by the connecting rod and the line of reciprocation.

If we denote the wasted energy by We, the total thrust by T and the angle by X, we can express it algebraically by the formula:

$$We = T \sin X.$$

In many machines X is as great as 20 deg., the sine of which is 0.342. Calculating T, approximately, from a number of mowers, we found it to average about 60 pounds. Substituting these values in the formula we have:

$$We = 60 \times 0.342 = 20.52 \text{ pounds},$$

the travel of the knife being generally one-third greater than that of the machine, which averages 240 per minute, hence we have for wasted energy per minute:

$$We = (240 \times \tfrac{240}{3}) \times 20 = 320 \times 20 = 6400$$

foot pounds, which is loss of energy at the rate of nearly 0.2 horse-power as long as the machine is doing full work, or an amount of 290,400 foot pounds of wasted energy per acre.

The motion of the sickle may vary in two ways: first, in regard to length of stroke; second, in regard to the number of reciprocations per unit of linear advance of the machine. The length of stroke in practice varies between 2 and 6 inches; in the latter case the stroke is double the distance between guards. As already stated, 3 inches is the length of stroke most generally employed. The long stroke cannot well be employed in mowers, since the outer end of the sickle would protrude into the standing grass a considerable distance at the end of each stroke, where it would be liable to injury, because the shoe cannot well be made wide enough to protect it. In reapers, harvesters, and especially in headers, it is employed with advantage. A sickle with long stroke cuts very smoothly and effectively, and very likely requires less power than one with short stroke—the force necessary to overcome the inertia of the reciprocating parts in changing the direction of their motion is reduced to ½ at least. The long stroke has one other advantage, that the sections in passing entirely through one guard keep them clear; this a sickle knife, in passing from center to center, cannot accomplish. The number of reciprocations per unit of linear advance, say 240 feet per minute, seems to be much less settled to a standard than the length of stroke even, for it varies from about 300 in reapers to 800 in mowers, being the same in no two machines of different make.

Scarcely anything has been done to determine, by scientifically conducted experiments, the relation existing between the speed of sickle, length of stroke, length and inclination of cutting edges and distance between guard-fingers, which, for the average speed of draught-horses, would give the highest efficiency, combined with durability and economy of first cost.

It is evident that, for a given distance between guards, if the length of stroke be made double, treble, etc., that distance, the effectiveness of the cutter will be increased in the same ratio, provided the number of reciprocations remain unaltered; also, for a given linear speed of sickle, we may reduce the stroke if we increase the number of reciprocations in the same ratio, without altering the effectiveness of the cutter, provided the ratio of the length of stroke to the distance between guards remains the same; and again, the speed may be reduced without diminishing the effectiveness, by decreasing the distance between guards correspondingly and increasing their number and the number of knife sections in the same ratio, provided the length of stroke remains an integral multiple of the distance between guards. Thus we see that for a given effect, the speed of sickle varies inversely as the ratio of the length of stroke to the distance between guards; or, in other words, inversely as the number of guards against which each knife section acts during one entire stroke, and, if that ratio be unity, the speed varies directly as the distance between the guard fingers. Hence by indefinitely reducing the distance between guards, and increasing their number and the number of knife sections in the same ratio, it follows that—theoretically—any speed of knife can produce a given cutting effect, and if the cutting edges were perfect a minimum speed would give a maximum efficiency.

Practically, however, the problem has quite a different aspect. The cutting edges cannot be made perfect. Each guard finger being required to have a certain strength will occupy a certain space that limits the number, which can—mechanically—be placed side by side in the length of the cutter-bar; a definite distance required between them still further reduces the number that can be employed in practice. While efficiency, apparently, requires the greatest number of guard fingers and knife sections that can be effectively employed, economy demands the least number that will do the work.

As for the inclination of the cutting edges but little can be said. Supposing, however, they be perfectly sharp, there is no reason why the effectiveness should not be the same for any angle between 0 deg. and 180 deg., although the efficiency would, very probably, increase with the angle. The angle most common in practice is 60 deg., but there is no doubt that it should vary with the speed of sickle.

In the "Reports of the Commissioners to Vienna" it is stated that, according to Langres' experiments, 670 to 920 reciprocations per minute were the best velocities for mowers, and that Grignon had found 320 to be the best speed for reapers. We have not been able to ascertain how those figures were derived; in themselves they are of little value, since the rate of advance of the machine is given in neither case; it is evident that any velocity may be given to the sickle by simply increasing or retarding the speed of the machine. The best speed, furthermore, depends upon the length of stroke, distance between guards and, very likely, the angle of the cutters, of which nothing is said in the reports.

To determine experimentally the relation existing between the above-mentioned quantities for obtaining the best effect, is a problem which presents many difficulties. The conditions vary continually, and cannot be determined with any degree of precision. The power employed to propel the machine being always animal power is never uniform. The growth of the grain is never even, and its state of maturity will also vary in different parts of the field. The soil is always more or less undulating, and varies in softness according to its nature, condition and location.

All these external causes, which cannot be eliminated from a field trial, produce effects which might seriously impair the results and cause false conclusions to be drawn.

(To be continued.)

* Beautifully illustrated in the American Mechanical Dictionary, pp. 1489 and 1492.

The National Portland Cement Co.

The National Portland Cement Company, of Kingston, N. Y., are engaged in the manufacture of a cement which, from its uniformity and great strength is of great value to the builder. At the Centennial it was subjected, as were the other cements exhibited, to a severe series of tests, in order to ascertain its power of resisting both tensile and crushing strains. In these trials most extraordinary strength was shown by the cement. The following table contains the average results attained with this and the best cements on exhibition at Philadelphia:

Cements, where made.	Crushing strength per sq. in.		Tensile strength per sq. in.	
	Lbs.	No. trials.	Lbs.	No. trials.
National Portland Cement Co., of Kingston, N. Y.	1482	20	213	5
German Portland Cement, Stettin, Germany	1439	12	216	3
English Portland Cement, near London	1330	10	216	3
English Portland Cement, near London	1140	12	199	3
Sayler's Portland Cement, Coplay Cement Co., Coplay, Pa.	1078	8	184	2
Wampum Cement & Lime Co., New Castle, Pa.	968	12	168	3
Pavin de Lafarge, Tell, Canton of Viviers, France	931	12	158	2
A. H. Lavers, London, England	926	6	192	2
Francis & Co., London, England	907	14	163	3
Wm. McCay, Ottawa, Can.	882	10	141	3
Borst & Roggenkamp, Delfyl, Netherlands	826	12	132	3
Longuety & Co., Boulogne-sur-mer, France	764	12	108	3
Riga Cement Co., Riga, Russia	693	5	134	2
Seaman Cement Co., Lomma, n'r Malmo, Sweden.	606	14	112	3
Bruno Hofmurk, Port-Kund, Esthland, Russia.	580	6	154	2

The Roman and most of the other cements shown are very far below these figures.

There were 19 other cements tested at Philadelphia, the tensile strengths in several instances falling below 30 pounds per square inch and the crushing strength below 200 pounds.

All the cements exhibited at Philadelphia were carefully tested before awards were recommended, by mixing them dry in each case with an equal measure of clean sand, tempering the mixture with water to the consistency of stiff mason's mortar, and then molding them into briquettes of suitable form for obtaining the tensile strength on a sectional area 1½ inch square, equal to 2¼ square inches; the briquettes were kept in the air one day to set, then immersed in water six days, and tested when seven days old. After thus obtaining the tensile strength in each case, the ends of the specimens were ground down to 1½-inch cubes, which were used the same day for obtaining the compressive strength by crushing. The results averaged from a number of trials with each sample of cement, and divided by 2¼ in order to get the strength per square inch, are recorded in the table. It may be stated, in further explanation, that although the results show beyond question, under the conditions named, the strength of the several specimens exhibited, it may not correctly indicate the relative merits of the customary productions of the several manufactories represented. Some of them may have used especial care in preparing the article exhibited, while others may have sent average samples from stock on hand.

General Q. A. Gillmore, in an article upon the cements, etc., exhibited at Philadelphia, says:

"The cement exhibited by Messrs. Toepffer, Grawitz & Co., of Stettin, Germany, made from an artificial mixture of lime and clay, justifies, by its excellence, this manner of manufacture. * * * *"

It may be here stated that "The National Portland Cement Company," of Kingston, has been organized for making this cement at Kingston, Ulster county, N. Y., on the bank of the Hudson River, the materials employed being Fuller's earth, kaolin and lime. They are thoroughly ground and mixed together by the wet process, although much less water is employed in the manipulation than in either the English works on the Thames or the works at Boulogne, France. Samples of this cement recently tested gave excellent results, as good as those obtained with the best article on exhibition.

It is hoped and believed that the manufacture of Portland cement in the United States has taken such a start that in a short time, possibly within a few months, very little, if any, of the foreign article will find a market here, except upon the Pacific coast, where it will be procured by direct importation. The natural light, quick-setting cements, known as Roman cements, are produced by burning at a comparatively low heat—not greatly exceeding in intensity and duration what would suffice to expel the carbonic acid—certain argillaceous or silicious limestones, usually containing less than 77 per cent. of carbonate of lime, or argillo-magnesium limestones, which contain less than 77 per cent. of both carbonates, and then grinding the product to a fine powder between millstones. They can be and in Europe were formerly produced artificially, by burning a mixture of lime, or of carbonate of lime and clay (before Portland cement became known) by the discovery that with certain definite proportions of the ingredients, and by burning at a high heat, the quality of the product became vastly improved. The greater value of the Portland cement, producing as it does a mortar possessing about four times the strength at much less than twice the cost of the light, quick-setting artificial cements, gradually drove these from the market, and their manufacture soon ceased and has never been resumed.

It is not to be expected that the use of the natural light cements will be altogether superseded by that of Portland. At the same time it must be admitted that for similar purposes good Portland cement suitably diluted with common lime, in order to bring it down to the standard of natural cements, is, in most localities, the least costly of the two.

The process of manufacture employed by the company at Kingston consists in burning lime in the kilns, then placing it in the top story of the mill, from which, after being weighed to secure the right quantity, it is shot down into large tanks containing water, and in which are large revolving stones, by means of which it is crushed and slaked. The requisite quantities of the different clays are then added, and when thoroughly reduced and amalgamated, the charges are sent below into a large tank in which are revolving blades, and, passing in transit through Burr mills rapidly revolving and dressed smooth, by means of which all the small particles are crushed out, a smooth, even mixture is obtained. From this large tank the material is discharged on a heated brick floor, from which, when sufficiently dry, it is removed by cars up an incline to the top of the kilns, where, after being pressed into bricks by means of a steam brick machine, it is placed in the kilns and burnt into a clinker of a dark green color. It then goes into the top floor of the mill and descends through crackers and French burr mills into the barrels at the packers, which when coopered are placed in the store shed for shipment at the dock. As the cement made by this process must be of a uniform and unvarying quality, and the materials being combined to secure the highest test cement, this fact alone will give it a preference over imported cements, which, from the varying character of the clay used, must produce a like character of cement, as is found by all large consumers who use testing apparatus. It was the experience of General Schuyler Hamilton, U. S. A., while employed as engineer in the Dock Department, that of the samples of foreign cements offered the department by importers but few would stand much over half the required government test.

The National Portland Cement Company intend manufacturing their cement in quantities to supply the trade as fast as required, and by means of their facilities for manufacturing, shipping, &c., can compete in price with the world.

The telescopic spar torpedo, a model of which was submitted recently by one of the laboratory artisans named Griffiths, was tried in the Thames on the 9th inst., with a roughly constructed apparatus but on the full scale. The spectators, who were taken out into the stream in a steam launch, saw only a couple of poles, each about 30 ft. in length, lying upon the deck, one upon the other, with a red disc at the extremity to represent a charge of gun-cotton, and the other end made fast a little astern of midships. The practice consisted of taking aim at the floating buoys in the river as the launch steamed past at full speed, and simple as the affair looked the effect was remarkable. Steering within a calculated distance of about 50 ft. the torpedo was cast overboard, when the tide and the motion of the vessel carried it out to arm's length, and at the same time caused the upper spar to stretch out in telescopic fashion, carrying the torpedo head completely under the object attacked. It was the opinion of all who witnessed the experiments that the invention was both clever and valuable, capable of rendering useful service even in the hands of an unpracticed crew, and certainly to be preferred to the ordinary spar torpedo suspended over the bows of a vessel attacking end on, and risking its own destruction.

We learn from the Moline (Illinois) *Review* that the Barnard & Leas Manufacturing Co., of that city, are about to erect a large new foundry building, 60x80 feet in size, with 18-feet post and slate roof and all modern improvements. They mean to have one of the finest buildings for the purpose in this city. This large addition to the capacity of the works of the B. & L. Mfg. Co., is made necessary by the steady increase of their business. There is no industry in the west to-day making greater advance than the milling industry, and those establishments which, like the above, make a specialty of mill machinery, are driven to the full extent of their capacity.

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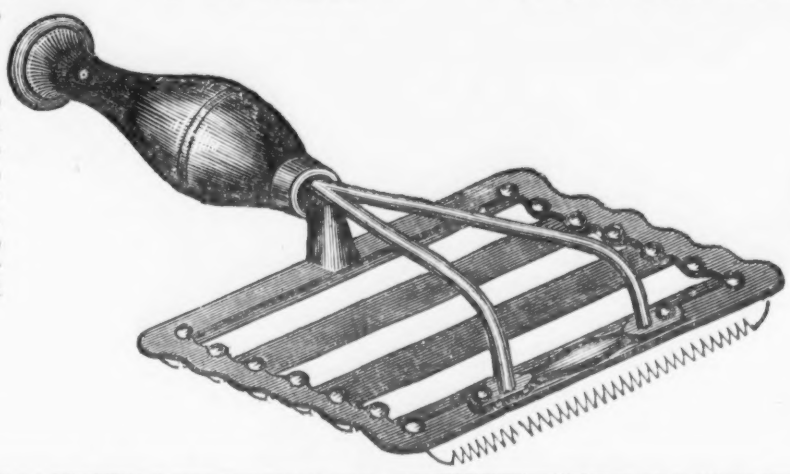
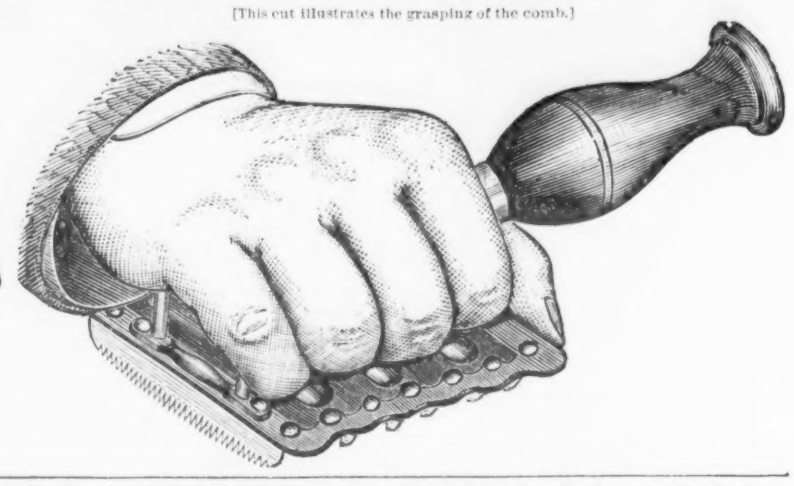


[This cut illustrates the grasping of the comb.]



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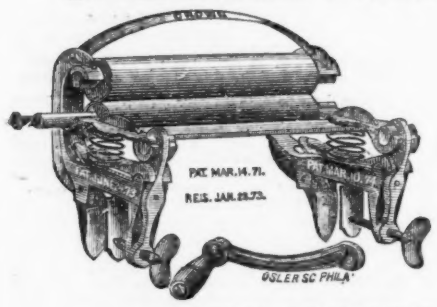

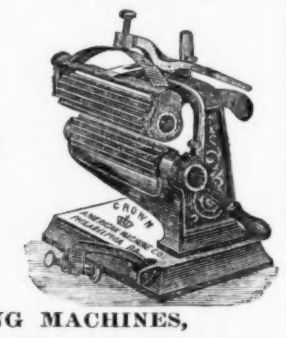

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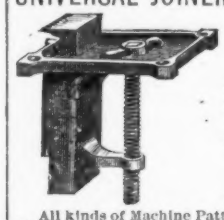
Inventor and Manufacturer of the

UNIVERSAL JOINERS for Steam and Foot Power.



ALSO

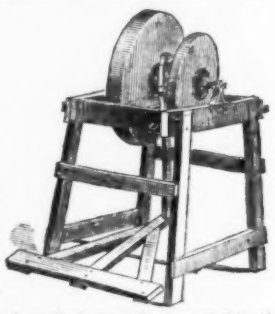
Patent Grindstone Frame.

This is the greatest invention of its kind in the market. Can be worked from either right or left side. I sell to dealers the treadle and shafting only, or fancy frames with treadle and shafting complete (without stone).

I also call attention to my Patent Perfect

BENCH STOP.

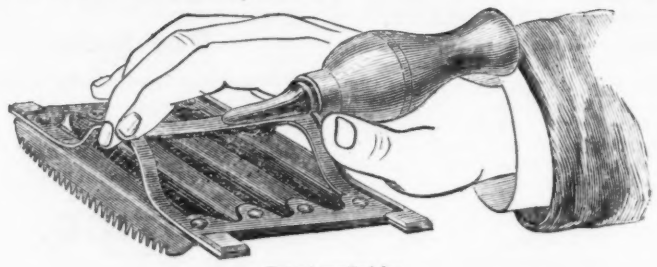
This stop is stronger than any in the market, and is a perfect stop.



All kinds of Machine Patterns made to order. Special attention paid to Mechanics' Tools and Patent Office Models.
Send for circulars.

WORKS: COR. SECOND & CENTRAL AVENUES, CINCINNATI, O.

THE POPULAR CURRY COMB



Patent applied for.

A FULL LINE OF NEW CURRY COMBS.

Packed ½ doz. in strong paper boxes, 24 doz. in Wooden Cases. Send for price list.

WM. P. KELLOGG & CO., Troy, N. Y.

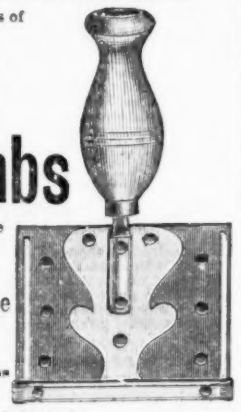
Wiebusch & Hilger Hardware Co., New York, Agents for the United States.

D. W. HAZLETON & CO

724 Girard Ave., Philadelphia

Manufacturers of

Curry Combs



Galvanized Square and Ornamental

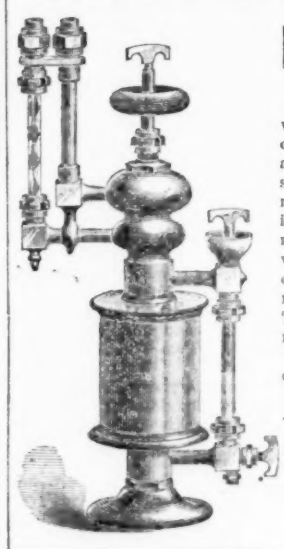
Conductor Pipe

RIBBED TUBING

Stamped & Press Work to order.

Correspondence Solicited.

HARPER'S LUBRICATOR



For Steam Engines.

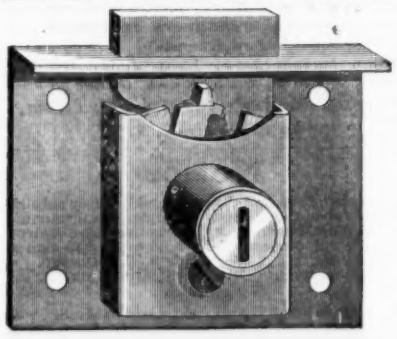
This invention is an improvement upon that class of Lubricators in which the lubricating material is floated from the reservoir by the condensed steam passing into the reservoir, and may be applied to all kinds of Steam Engines by introducing the Lubricant into the steam pipe so that it thoroughly lubricates the valves, piston and rods, reducing friction, thereby saving oil, coal and packing, and adding greatly to *the easy working of the Engine.* The glass tube connected with the reservoir indicates the quantity of oil in the reservoir; the upper glass tube the quantity of oil escaping. The quantity of oil admitted to the engine can be regulated with certainty. We might claim great economy of oil; that we leave with the engineer. This invention is in practical operation, and is very highly recommended by the best engineers, and all now using it.

This invention is secured by Letters Patent of the United States dated September 26, 1871, and April 4, 1877.

Information concerning the Lubricator may be obtained from our Agents, or by addressing

The Harper Steam Lubricator Co.,

WESTVILLE, CONN.



A NEW

Drawer Lock.

THE

"STANDARD."

Applicable also to Cupboards, etc.

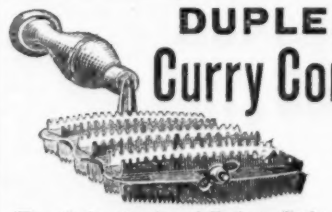
Made wholly of Brass, and finely finished. Each Lock has two flat, steel, nickel-plated Keys.

Dealers desiring to examine this Lock will receive a sample without charge, by addressing

The Yale Lock Mfg. Co.,

STAMFORD CONN.

List Price, - - $8·50 per dozen.



DUPLEX

Curry Comb

We call the attention of Hardware Dealers to our Double Curry Comb, comprising a fine and coarse side: or virtually two combs in one. It is useful, durable and novel, and needs no argument to convince any one of its practicability. It sells on sight and is bound to supersede all other combs. We want one reliable dealer in each State or large city to handle it. Correspondence solicited. Address

I. N. CASSELL, Fredericktown, Ohio.

PATENT DOUBLE ACTING SPRING BUTTS.

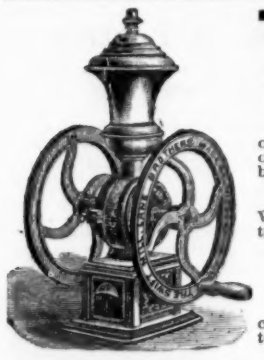
Patented April 18,1876.

Send for price list and circulars

FOR SWINGING DOORS BOTH WAYS.

These Butts are the first ever constructed with two leaves only, and with flanges attached thereto for fastening to the door and casing, thus rendering them much more substantial and easy to put on, as the screws are all driven from the outside. By means of the flanges the door is hung firmly to the casing, instead of to a strip *as is the case with all other double acting Butts,* and the screws do not become loose, as the strain on them is much less. On the back of the Butt is a powerful volute spring, and draws in *direct line* with the center of the door, thus holding the door firmly in position, and *obviating all sag.* Our price list is from 25 to 40 per cent lower than others. Manufactured by

THE SABIN MFG. CO., Montpelier, Vt.



THE SWIFT MILL.

ESTABLISHED 1845.

The annexed cut shows one of the many styles of Coffee Mills of our manufacture, especially adapted to Grocers' use and all retailers of coffee. They are highly ornamental, and workmanship of the very best. We make more than 30 styles.

ALSO LANE'S PORTABLE COFFEE ROASTER

Will roast 30 to 40 lbs. at once, and can be used as a stove at other times. Send for descriptive list to Manufacturers.

LANE BROS., Millbrook, N. Y.

Also sold by leading wholesale houses.

Our agents, Graham & Haines, 113 Chambers St., New York, carry a full line of our goods, and will be pleased to serve you at Factory prices.

PROTECT THE WALLS.

The Star Friction Mat,

To light Matches on.

THE STAR FRICTION MAT,

With Pocket to hold the Matches.

Send for illustrated price list.

J. B. COLT & CO., Manufacturers of NOTIONS.

Factory, Brooklyn, L. I. Salesroom, 297 Broadway, N. Y.

SPECIALTIES TO ORDER.

CARRIAGE SPRINGS.

JOHN H. REOCK, PASSAIC SPRING WORKS,

Manufacturer of Railroad Car, Locomotive, Omnibus Platform and every variety of Carriage and Buggy Springs. 272 to 280 Passaic St., Newark, N. J. Lock box 165

BAEDER, ADAMSON & CO.,

Manufacturers of SAND & EMERY PAPER & EMERY CLOTH.

(Also, in Rolls for machine work.)

Ground Emery, Corundum & Flint, Glue & Curled Hair, Hair Felt, & Felting for Covering Boilers, Pipes, &c., Cow Hide Whips.

Stores: PHILADELPHIA, 730 Market St., NEW YORK, 67 Beekman St., BOSTON, 143 Milk St., CHICAGO, 182 Lake St.

INDUSTRIAL ITEMS.

NEW HAMPSHIRE.

The Littleton Scythe Company have started again and are manufacturing large quantities of scythes and axes.

The Nashua Iron and Steel Company have reduced the wages of their help fifteen per cent.

VERMONT.

The Ketchum Nail Works at Fairhaven have been sold to C. P. Harris & Co., who will consolidate them with the Rutland Nail Works.

MASSACHUSETTS.

Brigham, Littlefield & Vining are doubling the size of their machine shop in South Abington, to enlarge their facilities for the manufacture of Hendrey's patent carriage axle.

The new Siemens gas furnace just put in by the Tremont Nail Company, at Wareham, has been started up and proves a success, causing a great economy of coal and a still greater improvement in the quality of iron manufactured.

CONNECTICUT.

Thomas Alexander, of Meriden, is to occupy a portion of a factory at South Farms, Middletown, for silver-plating purposes, and the remainder is to be occupied by Penfield & Sons, manufacturers of vises.

The Pratt & Whitney Company, of Hartford, report that the orders received during the present year had, up to the first of July, been more than twenty per cent. greater than during a similar time last year, and since then have more than doubled that proportion. Indeed, the demand for their productions during the last two months would have filled their premises with workmen but for the accumulation of machinery already built. They have recently received a foreign order of some extent, and numerous orders from New Haven, Bridgeport, Norwich, Springfield, Worcester, Philadelphia, Chicago, and from smaller places, for tools for manufacturing purposes.

The Sharps Rifle Company are now running at night making sample guns for the Chinese government.

NEW YORK.

The Brooks Locomotive Works, of Dunkirk, have orders for one 42-inch gauge passenger engine for the Covington, Columbus and Black Hills Railroad, and for five consolidation engines for the Erie.

NEW JERSEY.

Hewes & Phillips, of Newark, have their shops full of work for the first time in many years. They have orders for several large stationary engines, including two very heavy rolling-mill engines, besides a good deal of miscellaneous work.

PENNSYLVANIA.

The rolling mill at Port Clinton, which has been busily working for the past seven or eight months, is still in operation.

The Moslem Furnace is expected to go into full operation before long. The necessary outside repairs have already been made, and reports say that the stack is to be lined. A new blacksmith shop and new office are shortly to be built, and no doubt the furnace will be started at no distant day.

During the month of August there were shipped from the works of Messrs. E. & G. Brooke, of Birdsboro, 17,712 kegs of Anchor brand nails, against 12,540 kegs during the month previous. During the same period they manufactured 13,514 kegs, against 7502 kegs during the previous month. The shipments of August were the largest ever made in one month by this firm.

The Allentown Iron Company, having again all its furnaces in blast, will employ at its works and ore beds all the force it formerly had.

The Pottstown Iron Company are disposing of nails in large quantities, having on Saturday the 8th shipped 1600 kegs, Monday the 10th, 1000, and Tuesday they shipped away about 2400 kegs.

On last Monday, the 10th instant, the ax factory of R. Mann & Son, near the village of Mill Hall, in Clinton county, was totally destroyed by fire. Loss, $20,000; covered by insurance.

The Baldwin Locomotive Works, at Philadelphia, are building 10 engines for the Missouri, Kansas and Texas, Railroad four for the Atlanta and Charlotte Air Line and two for the Greenville and Columbia. The report that these works are to be removed from Philadelphia is revived, the place now named being on the line of the West Jersey Railroad, in Gloucester county, N. J., but the report must be considered doubtful.

Mr. Hillary Missimer, of Reading, who had been sent on a special mission to South America to secure a coal market for the Reading Coal and Iron Company, has returned from his tour. He speaks hopefully of the prospect for marketing their coal product.

The Clymer Furnace, formerly a charcoal furnace, but subsequently turned into an anthracite furnace, is not fully completed.

The Ætna Iron Works, New Castle, appear to be in an exceedingly prosperous condition at present. They have a large number of orders ahead, and are running double turn and to the full capacity of the mill. The two furnaces belonging to this company are also in operation, one turning out Bessemer and the other foundry iron. The 53 nail machines in the factory have each an automatic feeder attached, and are turning out a large quantity of nails daily.

Work has been begun at filling the fifth stack of the Allentown Iron Works.

Five stacks of the Thomas Iron Company have been in blast, and it is thought that six will be in operation during the coming winter.

The Lehigh Iron Company at Aineyville, has one furnace in blast, the Allentown Rolling Mill Company one, and the Allentown Iron Company five, which gives that city a livelier appearance than it has had for many a day. The iron market remains dull, notwithstanding the prevalent idea that matters have touched bottom and are improving.

PITTSBURGH AND VICINITY.

Eliza Furnace No. 2, Laughlins & Co., 62 feet by 14 feet, has been in blast uninterruptedly for over four years, averaging about 70 tons daily. The production has reached 86 tons some days. The furnace, to all appearances, will last for months yet. This is a good record, but we hardly think it is the best the country has done.

The strike at Jones & Laughlin's still continues. The proposition of the firm to increase the wages of the 80 cent men to $1 per day, and reduce the day to 10 hours, was debated and rejected, and it was decided to stand out for an advance of 10 per cent. on the wages of all laboring men. They claim that the fact that their places could not be filled in eight weeks is evidence of the justice of their claims, and that they have the sympathy of the public.

The Edgar Thomson Steel Works (Limited) have just had placed in their works a drop for testing full sections of rails or axles. The drop weighs 1640 pounds and has a fall of 47 feet.

Messrs. Lewis, Oliver & Phillips have bought from the Pennsylvania Railroad all the scrap from the ruins of the fire of last July. At the time the bids for the same were opened they were the successful bidders for 3000 tons, and have since contracted for the balance.

The Pittsburgh Industrial Exposition is now opened to the public. It is a very good display, and is being well patronized.

Nearly all the flint, table and pressed ware glass factories are in operation. The great increase in the beer bottling business has caused an immense demand for pint and quart bottles, and this branch of business is better than ever before. Several establishments are running exclusively on orders for beer bottles.

Messrs. Lewis, Dalzell & Co. have lately made an important addition to the dripping pans they manufacture by placing handles on the same, thus furnishing them ready for use and adding much to their convenience.

Of the twelve blast furnaces in Pittsburgh five are in blast—No. 1 Lucy, No. 1 Isabella, No. 1 Shoenberger, No. 1 Eliza and the Clinton. No. 2 Isabella wns banked up some months ago, but is probably cold by this time. No. 2 Lucy, just constructed, is nearly ready to blow, but it has not been determined to start it. No. 2 Shoenberger is ready for blast, and will be put in when No. 1 has to blow out for relining. Soho will blow soon. Of No. 2 Eliza we speak elsewhere. The two Superior furnaces are hopelessly idle.

OHIO.

Morgan, Williams & Co., of Alliance, expect to transact a large business in the manufacture of their new patent drop hammer boiler punching machine. They have lately furnished a 2-ton steam hammer for the Beaver Falls Steel Company, a large steam hammer for parties in Chicago, one for a company at Parker's Landing, Pa., and one for San Francisco. They are now building a 1-ton helve hammer for a Pittsburgh concern, and a 650-pound drop hammer for the Beaver Falls Manufacturing Company.

The Geneva Tool Company have resumed operations.

The Ætna Mill, Bridgeport, has her new rolls in place and is running double turn, giving employment to 300 men.

Lawrence Furnace Company has made an assignment to Geo. N. Gray; bond, $180,000; appraisers, W. C. Amos, H. D. Newcomb and Thos. McGovney.

An exchange says, speaking of the Cleveland mills: The Cleveland Iron Company have run their puddle mill but two weeks in two months. The puddle furnaces are working in the Lake Shore Rail Mill, which is about all the puddling being done in Cleveland at present. Newburg is about the same. At the Etna, or Union Mill No. 2, puddling is all stopped, and at Union Mill No. 1 only a few furnaces are working.

There are 60 men now in the employ of the Cleveland Stove Company. Eight tons of iron are being melted daily at the establishment. The trade of the company is mainly in the West. Business prospects are good.

The Powell Tool and Plaster Company, Cleveland, is operating with 80 men, manufacturing axes, hatchets, edge tools of various descriptions, etc. Two steam engines are employed.

The work of narrowing the gauge of the rolling stock of the Cleveland, Columbus, Cincinnati and Indianapolis Railroad from 4 feet 9½ inches to 4 feet 8½ inches has been commenced, and as soon as it is sufficiently under way the gauge of the road will also be reduced. As the rolling stock comprises 156 engines and nearly 4000 cars, the task is not a light one.

T. J. Nottingham & Co., of Cincinnati, are putting up a heating apparatus in a large hotel at Memphis, Tenn., with their sectional safety steam boiler attachment. They are quite busy at this time in the work of putting up heaters with this attachment.

INDIANA.

The Benjamin Edge Tool Manufacturing Company, at Richmond, recommenced operations last spring, since which time they have been quite busy. They are now filling a large order for axes and cleavers. They make specialties of axes, hatchets, picks and mill picks, and the "Hunter" brand butcher knives.

ILLINOIS.

The Joliet mills are still idle.

The Phœnix window glass factory, La Salle, has failed.

WISCONSIN.

The Milwaukee rolling mills are in operation again. The rail, fish plate and merchant mills are running full time. The puddle, top and bottom mills single turn.

MICHIGAN.

The Munissing furnace is averaging 31 tons per day.

It is rumored that the Bancroft furnace is soon to start.

There is a prospect that the Marquette and Pacific furnace will be kept in blast the coming winter.

KENTUCKY.

W. C. Kelly, ax manufacturer, Louisville, reports orders booked for 1000 dozen axes.

Scantan, Drew & Co., Louisville, are turning out a large lot of hollow-ware on orders.

Byrne & Mackenzie's chain works, Louisville, have started up again, and are employing full force. They are in need of more skilled workmen.

Thos. Meikle & Co., Louisville, are running full time and employing 100 hands on plows and elevators. The polishing machines for the Jeffersonville Plate Glass Works are being gotten out by this firm.

Grainger & Co., Phœnix foundry, of Louisville, are compelled to cast every day so brisk are orders.

TENNESSEE.

The Chattanooga *Commercial* says Mr. J. C. Vance is in correspondence with Mr. W. G. Comerford, of Howard, Pa., who is thinking of going to Chattanooga and erecting a mill for the manufacture of hoop iron and cotton ties. Mr. Comerford is connected with the Lauths, of Howard.

MISSISSIPPI.

Dr. Wm. J. Carroll, of Natchez, has sold to the American Cotton Tie Company for $1000 cash, four unpatented devices for American cotton ties.

Special Notices.

BY T. F. STEWART.

TRUSTEE'S SALE

OF

Very Valuable Charcoal Furnace,

SITUATE AT

ESCANABA, MICHIGAN.

The undersigned will sell at AUCTION, for account of whom it may concern, at the Chamber of Commerce, in the city of Pittsburgh, Pa., on

THURSDAY, OCTOBER 11th, 1877,

at 2 o'clock p. m., the very valuable property known as the

ESCANABA FURNACE,

with all its appurtenances, together with about **27,000** ACRES OF WOOD LANDS, very carefully selected by experts, on which have been erected 49 charcoal kilns. The furnace is 12 feet bosh, 51 feet stack, iron truss roof, thoroughly fireproof, with buildings, foundations and hoisting machinery for a second stack, all constructed in the best manner. There are numerous tenement houses, store houses and other buildings, and a large dock on the bay, adjoining the furnace, with unusual facilities for procuring limestone.

There will be sold in conjunction with the realty, a large amount of personal property, comprising probably TEN THOUSAND CORDS OF WOOD, a large quantity of Limestone, Iron Ore, Charcoal Goods in Store, Wagons, &c.

This property MUST BE SOLD for the benefit of creditors. It is probably the finest Charcoal Furnace in the country, the wood lands affording an almost inexhaustible supply of hard wood, and it must, in the near future, become exceedingly valuable.

TERMS.—Cash; ten per cent. on day of sale, and balance within thirty days thereafter.

For particulars apply to the Trustee at Pittsburgh.

J. R. McCUNE, Trustee.

T. F. STEWART, Auctioneer.

Iron Foundry For Sale or Rent.

The foundry of the IVES MFG. CO., in the village of Medina, is offered for sale, or will be leased for a term of years, on very favorable terms, to any party desiring to engage in the business and who will purchase the patterns and machinery of the company. The location of the premises is most desirable, being on the bank of the Erie Canal and on the main business street of one of the most flourishing villages in Western New York, and near by the N. Y. Central & H. R. Railroad. Special low rates of freight to and from all points east or west can be effected. The patterns are good for Sinks, Pipe and Fittings, and a general line of Plumbers' Iron Ware, for which there is a large established trade and increasing demand.

Correspondence or personal inspection solicited up to October 3d; if not disposed of, a public sale will be held on Wednesday, Oct. 10, at 1½ o'clock p. m., on the premises. A schedule of the property will be furnished on application.

E. S. WHALEN, Assignee.

MEDINA, N. Y., Sept. 17, 1877.

To Manufacturers.

Being already engaged in selling heavy goods for direct shipment from the manufacturers, we wish to add one or two lines to those we now handle. Will be pleased to correspond with a view to act as representatives at this point. Unexceptionable references given. For further particulars address

NEAVE & PEIRCE,
33 West Third St., Cincinnati.

SPECIAL NOTICE.

The undersigned, in view of the **Paris Exhibition** of 1878, begs to inform his friends that he continues to make translations of Catalogues, Prices-current, Circulars, Correspondence, &c., from and into the —

ENGLISH,
FRENCH,
GERMAN
and **SPANISH,**

and that he bestows special attention upon a strictly correct rendering of **Technical Expressions** in matters relating to **Machinery, Metallurgy, Hydraulics,** &c. The very best reference will be furnished from leading manufacturers in this city, Philadelphia and elsewhere, for whom he has translated. If desired, estimates will be procured for the setting up, electrotyping and printing of catalogues, &c., in the above languages.

C. KIRCHHOFF,
Metal Reporter of The Iron Age,
83 Reade St., New York.

SITUATION WANTED.—As Salesman or Bookkeeper, by a young man, unmarried, who has filled like positions in a Hardware manufacturing company in New York for ten years past. He is ready to go to any part of the country at the shortest notice. Highest references. Address

B. L. B.,
Office of *The Iron Age*, 83 Reade St., New York.

To Hardware Manufacturers.—A young man for the past six years connected with a Hardware house as bookkeeper and salesman, desires employment. References if desired.

Address N. T. H.,
Office of *The Iron Age*, 83 Reade St., N. Y.

Hardware and House Furnishing.—Situation wanted by a young man as salesman in either capacity. Has had ten years' experience with last employer. Can give all reference required as to honesty and ability.

Salesman,
Office of *The Iron Age*, 83 Reade St., N. Y.

Special Notices.

FOR SALE,

THE FOLLOWING

New and Second-Hand Boilers Engines, &c.

New Engines and Boilers.

15 horse Horizontal Engine, 8x12 cylinder, double crank, $230. 15 horse Horizontal Engine, 8x12 cylinder, single crank, $230. 20 horse Horizontal Engine, 9½x13 cylinder, single crank, $275. 10 horse Vertical Engine, 6½x8 cylinder, $250. 4 horse Vertical Engine, 4½x5 cylinder, $110. 4 horse Engine and Boiler, complete, ready to run, $240; boiler vertical tubular; tested to 150 lbs. 5 horse Engine and Boiler, complete, ready to run, $285; boiler, vertical tubular, tested to 150 lbs. 3 horse Vertical Engine and Boiler, complete, ready to run, $175. 8 horse Bacon Hoisting Engine and Boiler, complete, ready to run, $575. 4 horse Vertical Tubular Boiler, $125. 6 horse Vertical Tubular Boiler, $145. 8 horse Vertical Tubular Boiler, $160. 11 horse Vertical Tubular Boiler, $200. 16 horse Vertical Tubular Boiler, $290. 40 horse Horizontal Tubular Boiler, $580. One Upright Drill, swing 24 in., $125.

Second-Hand Engines, Boilers, &c.

60 horse Horizontal Engine, 16x20 cylinder, $800, good order. 60 horse Locomotive Style Boiler, $500, good order. 6 horse Locomotive Style Boiler, $125, good order. 4 horse Vertical Tubular Boiler, good as new, $100. 12 horse Horizontal Engine, 7½x10 cylinder, pump, heater and governor, $225, good as new. 11 horse Vertical Engine, 7x10 cylinder, $200. 8 horse Horizontal Engine, 6x12 cylinder, $125, good order.

We also have two new power or hand Pipe Cutting and Threading Machines, cut from ⅛ to 2 in. pipe, with full sets of dies, ⅛ to 2 nipple sockets, price $60 each; several bench and foot lathes from $30 to $50.

Also Steam Pumps, Pipe, Belting, Valves, Fittings, &c., &c., &c.

Write us, stating what you want, new or second-hand, and we will answer cheerfully.

Lovegrove & Co.,
125 N. Fourth St., Philadelphia.

Ramsey's Car Truck Shifting Apparatus.

A Practical Testimonial.

PENNSYLVANIA & NEW YORK CANAL & R. R. Co.,
Office of General Superintendent,
SAYRE, PA., August 17th, 1877.

To whom it may concern: This company has just constructed, at Erie Railway Junction, near Waverly, N. Y., a RAMSEY CAR TRUCK SHIFTING APPARATUS.

The undersigned, who have examined the construction and operation of this apparatus, have no hesitation in recommending its adoption for changing car trucks, or transferring through cars between roads of different gauges, and believe it to be the cheapest, simplest, most reliable and rapid device for that purpose now in use. At the trial to-day, with some parts of the machinery unfinished, a box-car was run over the pit, a distance of 200 feet, changing the trucks in 2 minutes and 15 seconds for the whole operation. It is believed that, with a longer pit and an increased number of side trucks, the time can be reduced to one minute per car, with no other motive power than gravity, and without the use of skilled labor.

R. A. PACKER, Gen'l Supt.,
Penna. and New York Canal and R. R. Co.
R. F. GOODMAN, Ass't Supt.,
Penna. and New York Canal and R. R. Co.
J. N. WEAVER, Acting Master Mechanic,
Penna. and New York Canal and R. R. Co.
JOHN TAYLOR, Gen'l Freight Agent,
Lehigh Valley R. R. Co.
W. STEVENSON, Gen'l Supt.,
Geneva, Ithaca and Sayre R. R. Co.

☞ Any information desired can be obtained by addressing

RAMSEY & SCARLETT,
Box 162, Cobourg, Ontario, Canada.

A GENTLEMAN HAVING A FOUR YEARS' experience in the agricultural implement trade on the continent, desires to make an engagement in a similar line, or in machinery or manufactures.

Has a first-class acquaintance in Germany, Austria, Belgium, Holland, Sweden, France and Russia.

Best of references given. Address

P. O. Box 972, Auburn, N. Y.

Lamberson's HARDWARE PRICE BOOK.

Half leather	$10.00.
Full "	12.00.
" " (Genuine Russia)	14.00.

Send for descriptive circular to

BUELL LAMBERSON,
97 Chambers St., New York.

Wanted,

American Articles for Export.

McCARTY & HASBERG,
449 Broadway, New York,

Are representing a new firm in Hamburg, Gemany. Parties interested or having suitable goods for export will please forward catalogues and price list.

AUCTION NOTICE.

Thursday and Friday, September 27th and 28th.

BISSELL, WELLES & MILLET, Auctioneers,

Will make a Special Sale of Hardware, Cutlery and House Furnishing Goods, on Thursday and Friday, Sept. 27th and 28th, at their salesroom, No. 15 Murray Street. This sale will consist of a good line of Hammers, Hatchets, Wrot. Goods, Saws, Locks, Butts, Files and Rasps, Brass Butts, Tin'd Harness Snaps, Axes, &c., &c. Also a full and complete line of French Tinned and Enameled Ware, Spoons, Coal Hods, &c., &c., together with a line of Breech and Muzzle Loading Guns.

FRIDAY, SEPT. 28th.

Large and attractive sale of Table Cutlery, S. P. Table Knives and Forks, Carvers, Shears, Clocks, &c., &c. Also 6 cases Pocket Cutlery, consisting of about 2000 doz. Pocket Knives and Razors, direct from bonded warehouse. This line will embrace a fine assortment of 1, 2, 3 and 4 blades, and Sportsmen's Knives, and will be worthy the attention of the trade.

Inventors

of articles in Builders' Hardware desiring to dispose of same by sale or on royalty, on reasonable terms, may address IRON MONGER,
Office of *The Iron Age*, 83 Reade St., New York

Special Notices.

CHARLES OTTO,

P. O. Box - - - 1199.

(ESTABLISHED 1854.)

Importer & Dealer in HARDWARE, Manufacturers' Agent, etc.

12 & 14 Front and 250 & 252 Market St., } *San Francisco.*

I am prepared to make arrangements with Eastern manufacturers to act as their agent for the sale of Hardware, etc., on the Pacific Coast.

REFERENCES:

Sargent & Co., 37 Chambers Street, New York.
VanWagoner & Williams, 82 Beekman St., N. Y.
T. Hessenbruch & Co., 10 N. 5th St., Philadelphia.
The Pennsylvania Tack Works, Norristown, Pa.
The Pacific Bank, San Francisco.

WANTED.—A first-class business man familiar with machinery and manufacturing, capable of handling large bodies of men, desires a responsible position. References satisfactory. Address,

IRON AND STEEL,
Care of *P. O. Box 813, Bridgeport, Conn.*

DROP FORGINGS.

The TRENTON VISE & TOOL WORKS, Trenton, N. J., having increased their facilities, are now able to do all kinds of

Iron and Steel Drop Forgings

in quantities to order at reasonable rates.

HERMANN BOKER & CO., Proprietors,
101 & 103 Duane St., N. Y.

SCHMIDT & ELBERS,

BREMEN, GERMANY.

Dealers Exclusively in American Hardware.

Manufacturers who wish to have their goods introduced in Germany, please correspond.

Hardware Business For Sale.

The old Stand, Stock and Good Will of the late E. H. Fogg. This store commands the largest wholesale and retail trade east of Portland. The best of help, and doing a prosperous business.

Address **H. H. FOGG,**
Bangor, Me.

TO LET,

A Light, Handsome Office.

Possession Immediately.

HERMANN BOKER & CO.,
101 Duane Street. N. Y.

SPECIAL NOTICE.

I have three patents for Dies, Machinery and Tools for making Augers and Bits, each running seventeen years; dated as follows: Dec. 19, 1865; January 31, 1866, and July 3, 1866. **There is a special claim on each of the dies.** All persons infringing on said patents will be held responsible to the extent of the law. **Russell Jennings.**

DEEP RIVER, Conn., Sept. 7, 1874.

New & Second Hand Machinery & Tools

One 30 in.x6 ft. Pond planer; one 21 in.x6 ft. Ferriss & Miles, do.; three 16 in.x3 ft. Pratt & Whitney, do.; one 15 in.x3 ft. New Haven, do.; twelve Pratt & Whitney milling machines; two extra heavy milling machines; one double head, do., Wood, Light & Co., makers; three bolt cutters, Wm. Sellers & Co., makers; one heavy chucking lathe; one 14 in. Putnam Shaper; one 8 in. N. Y. S. E. Co., do.; one heavy shear, cuts 2½ in.x4 in. iron; one 700 lb. steam hammer; one 1200 lb. do.; six 16 in.x8 ft. lathes; six 14 in.x6 ft., do.; two heavy upright drills; two Merrill Drops, 600 and 1000 lbs. hammers; thirty spinning lathes, 12 in. swing, 4 and 5 ft. beds. Lot small engines and other machinery.

The Bullard Machine Co., Limited,
14 Dey Street, New York.

For Sale.

The stock, lease and good will of an old established Hardware and Stove Business situated in a thriving village in Western New York.

Address *MONROE,*
Office of *The Iron Age*, 83 Reade St., N. Y.

NOTICE.

PHILADELPHIA, April 2, 1877.

On and after April 30th the Shipping Agency of **The Pennsylvania Warehousing and Safe Deposit Co.,** at Perth Amboy, New Jersey, will be discontinued.

B. K. JAMISON, Vice President.

SPECIAL NOTICE.

The undersigned offer their services as agents to **American Producers of Metals.**

They represent foreign brands of

Zinc, Russia Iron, Hoop Iron, Window Glass, Cutlery and Guns.

LOUIS WINDMULLER & ROELKER,
90 Reade Street, N. Y.

Notice

is hereby given that the partnership lately subsisting between the undersigned under the firm name of W. M. B. HAMMOND & Co. was this day dissolved by mutual consent. Either member will sign in liquidation.

WINTHROP M. B. HAMMOND.
Sept. 1st, 1877. WILLIAM S. MIDDLETON.

Notice is hereby given that a copartnership was this day formed by the undersigned under the firm name of W. M. B. HAMMOND & Co. Business will be carried on at 34 Warren Street, in the city of New York.

JOHN P. LYNCH.
WINTHROP M. B. HAMMOND.
Sept. 1st, 1877. WILLIAM S. MIDDLETON.

Wanted—A Partner,

In a foundry and machine business, already well established. Locality splendid and healthy.

A practical man with means is wanted to join a practical man who is already well established.

Address *CAR WHEEL FOUNDRY,*
P. O. Box 134, Selma, Alabama.

Wanted,

A General Agent in every State in the Union, for the sale of Wrought Iron Highway Bridges, new in design, combining maximum in strength and minimum in cost. For particulars address

WM. O. DOUGLAS,
Binghamton, N. Y.

Trade Report.

Office of THE IRON AGE,
WEDNESDAY EVENING, Sept. 19, 1877.

The past week has been one of comparative quiet in the financial markets. Advices regarding the state of general trade are full of encouragement, and the feeling in business circles grows better every day. With an increased demand for money in legitimate business transactions the market has become firmer. Early in the week the rate to borrowers on call advanced to 5 @ 6 per cent., but subsequently declined to 4 @ 5 per cent. The rate on prime business paper has been firm at 6 @ 7 per cent.

The gold market has been depressed, and the premium has touched one point under 103, corresponding with the quotation of January 26, 1862. We give below a table showing the daily range of the fluctuations:

	Highest.	Lowest.
Thursday	103¼	103¼
Friday	103⅜	103¼
Saturday	103¼	103⅛
Monday	103⅛	102⅞
Tuesday	103⅛	102⅞
Wednesday	103¼	103

Government bonds have been fairly active, but at lower prices, owing to the decline in gold. State bonds are quiet and strong; Railway mortgages strong but somewhat irregular.

The stock market has been feverish and unsettled, and especially weak for coal stocks. The principal dealings have been in Lake Shore, D., L. & W., Michigan Central, Western Union, St. Paul and Northwest. We give below the closing quotations of active shares.

The weekly statement of the New York banks shows a further loss in legal tenders and a large liquidation on deposits, the former being decreased $1,258,000 and the latter $1,991,700. The changes in the other items are slight, the circulation being up $8700 and the loans down $125,800 and the specie $48,600. The feature of the statement is the decrease in legal tenders and deposits, the natural result of continued shipments of currency to the interior to move the crops. The loss in deposits is larger than warranted by the other changes in the statement, and certainly indicates that in addition to legal tenders considerable amounts of national bank notes have been sent away. The result on the total reserve is a decrease of $1,306,600, and on the surplus reserve of $808,675. The excess of reserve above legal requirements is reduced to $11,813,300, against $23,077,775 this time last year, a difference that is to be regretted, for the reason that the banks will be called upon in the future for large amounts of currency to move the unusually large crops of grain, cotton and other products which the country has this year raised.

	Sept. 8.	Sept. 15.	Differences.
Loans	$243,920,800	$243,795,000	Dec. $125,800
Specie	19,961,600	19,913,000	Dec. 48,600
Legal t'nd'rs	45,303,900	44,045,900	Dec. 1,258,000
Deposits	210,574,100	208,582,400	Dec. 1,991,700
Circulation	15,568,400	15,577,100	Inc. 8,700

The movements in foreign trade for the week are shown in the following tables:

IMPORTS.

For week ended Sept. 15:

	1875.	1876.	1877.
Total for week.	$5,762,468	$5,001,875	$6,337,687
Prev. reported.	245,857,919	204,003,602	231,464,237
Since Jan. 1	$251,620,387	$209,005,477	$237,801,924

Included in the imports of general merchandise were articles valued as follows:

	Quantity.	Value.
Anvils	100	$816
Brass goods	22	3,361
Bronzes	30	6,702
Chains and Anchors	21	1,206
Copper		90
Cutlery	73	25,662
Gas fixtures	1	1,022
Guns	21	5,870
Hardware	22	1,878
Iron, pig, tons	100	1,534
Iron, sheet, tons	4	374
Iron, cotton ties	142	555
Iron tubes	350	373
Iron ore, tons	950	1,817
Iron, other, tons	326	15,236
Lead, pigs	6,934	40,024
Metal goods	161	21,358
Nails	22	677
Needles	9	3,042
Old metal		1,076
Platina	1	2,104
Plated ware	3	270
Per. caps	9	1,124
Saddlery	9	1,092
Steel	1,502	14,452
Silverware	6	1,075
Tin, bxs.	34,307	180,317
Tin, 3,087 slabs	205,216	30,874
Wire	437	3,875
Zinc	50,204	2,657

EXPORTS, EXCLUSIVE OF SPECIE.

For week ended Sept. 18:

	1875.	1876.	1877.
For the week	$4,620,232	$5,422,571	$6,551,589
Prev. reported.	177,288,970	186,606,623	195,751,821
Since Jan. 1	$181,909,202	$192,029,194	$202,303,410

EXPORTS OF SPECIE.

For week ended Sept. 15:

Total for the week	$118,659
Previously reported	22,312,787
Total since Jan. 1, 1877	$22,431,446
Same time in 1876	40,308,445
Same time in 1875	64,592,829
Same time in 1874	41,839,443
Same time in 1873	40,926,206
Same time in 1872	57,252,820

Government bonds at the close were quoted as follows:

	Bid.	Asked.
U. S. Currency 6's	121¼	122
U. S. 6's 1881 registered	109⅜	109¼
U. S. 6's 1881 coupon	110¾	110¾
U. S. 6's 1865 new reg	105¾	105⅝
U. S. 6's 1865 cou	105¾	105⅝
U. S. 6's 1867 reg	107¼	107⅛
U. S. 6's 1867 cou	107⅜	107⅜
U. S. 6's 1868 reg	109⅜	110
U. S. 6's 1868 cou	109¾	110
U. S. 10-40 reg	107⅛	107⅜
U. S. 10-40 coupon	108¼	108¼
U. S. 5s 1881 registered	107¼	107⅜
U. S. 5s 1881 coupon	107¼	107⅜
U. S. 4½s 1891 registered	105⅛	105⅜
U. S. 4½s 1891 coupon	105⅜	105⅜
U. S. 4s 1907 registered	101⅜	101¾

Following are the closing quotations of active shares:

	Bid.	Asked.
Atlantic and Pacific Telegraph	20	21
Chicago and Northwest	36	36⅛
" " Pref.	63	63½
Chicago, Rock Island and Pacific	102¼	102⅜
Chicago, Bur. and Quincy	101¼	102
Col., Chic. and Ind. Cent	4	4¼
Clev., Col., Cin. and Ind	40⅛	40½
Cleveland and Pittsburgh	82½	83
Chicago and Alton	85½	87
" " Pref	103	..
Consolidation Coal	22	..
Canton	21	24
Delaware, Lack. and Western	52⅞	53
Delaware and Hudson	49	49½
Express—Adams	99	99½
" American	51	52½
" United States	47½	49
" Wells, Fargo & Co	63¼	64½
Erie	11¼	11½
Harlem	140	142½
Hannibal and St. Joseph	13⅝	14
" " Pref	31	31½
Illinois Central	70½	70¾
Lake Shore	64⅝	64¾
*Michigan Central	60⅞	61
Morris and Essex	77½	78¼
Milwaukee and St. Paul	36⅛	36¼
" " Pref	70⅞	71
Mariposa	1	1⅝
" Pref	1½	1⅞
New York Central	102⅞	103⅛
New Jersey Central	17⅞	18
New Jersey Southern	½	¾
Ohio and Mississippi	7	7⅛
Pacific Mail	23⅛	23¼
Panama	111½	112
*Pittsburgh and Fort Wayne	90	..
Quicksilver	19¼	19½
" Pref	34⅝	35
St. Louis Kansas City Northern	4	4¼
" " " Pref.	24½	24¾
Toledo, Wabash and Western	13⅜	13½
Union Pacific	69⅜	69½
Western Union Telegraph	81⅜	81¾

* Ex dividend.

MINING STOCKS.

Mr. Ogden Haight, No. 65 Wall street, sends us the following report of the business of the New York Mining Stock Exchange for the week ending Sept. 19:

	Closing Quotations, in Currency.	Shares Sold.
Alpha	14.00	400
Belcher	6.87½	....
Bertha & Edith	.95	53,300
Best & Belcher	19.75	100
Bullion	8.75	800
Bobtail	2.50	100
Caledonia	4.37½	600
California	30.00	200
Chollar Potosi	38.50	....
Cleveland	6.25	1,200
Consolidated Imperial	1.12½	300
Consolidated Virginia	35.25	....
Confidence	5.25	700
Crown Point	4.00	100
Eureka	53.87½	500
Exchequer	9.62½	....
Gould & Curry	9.62½	....
Hale & Norcross	6.87½	....
Hukill	3.37½	750
Julia Consolidated	2.75	400
Justice	16.75	....
Kentuck	6.37½	1,600
Lacrosse	.32	8,700
Leopard	1.87½	1,000
Merrimac	5.00	150
Mexican	11.00	900
Moose	5.75	15,905
New York and Colorado	1.00	610
Northern Belle	19.75	300
Ontario	21.62½	300
Ophir	18.12½	900
Overman	26.37½	400
Raymond & Ely	14.62½	....
Savage	8.00	....
Seaton	.78	700
Segregated Belcher	42.87½	....
Sierra Nevada	5.00	....
Union Consolidated	6.00	....
Yellow Jacket	10.75	200

The largest number of transactions "officially" reported during the past week were in Bertha and Edith, aggregating over 50,000 shares. This company owns some 645 acres of property in Goochland county, Virginia, overlaid in part by auriferous gravel or "placer" deposits, which are now being worked by hydraulic apparatus as in California. Fifteen men are employed. About 1,500 cubic yards can be washed per day with the present apparatus. As high as $6 per cubic yard has been taken out. We think that this company has made a mistake in capitalizing their property at as high a figure as $3,500,000, and that it will be difficult for them to pay dividends upon so large an amount. The price ranged from $1.25 to 95c. per share, closing at the latter figure.

Moose, after selling at 5⅜ early in the week, closes at 5¾, with sales of 16,000 shares nearly. Lacrosse opened at 33c., dropped to 29c. on Monday, and closed at 32c. New York and Colorado closes at $1, sales of 610 shares.

GENERAL HARDWARE.

The volume of business seems to be entirely satisfactory to the trade here. During the week very little has transpired that is worthy of mention; values continue in the same condition as previously reported, those lines in which demoralization existed showing no sign of recovery. In Foreign Hardware the market continues active, and nearly all the importing houses are fairly employed.

The demand for Nails is steadily improving, and we have to report a firmer tone to the market, with light and in some cases badly assorted stocks. We hear from Wheeling reports of a bad break in the price of Nails, the particulars of which will be found in our Pittsburgh correspondence, but so far this market is unaffected thereby. We continue to quote 10d., $2.50, net, with an allowance of 10 cents per keg for 200-keg lots.

The demand for Deep and Common Stamped Tin Ware is active, and the recently established prices, viz., discount 45 per cent. for Deep and 35 per cent. for Common are, we are informed, strictly adhered to. The Lalance & Grosjean Mfg. Co. have adopted a net list for their Planished Tin Ware and some other miscellaneous goods which do not come under the classification of the Tin Ware Manufacturers' Association; they have also completed their assortment of Agate Ware, and are in a position to fill orders for the full line of these goods. The enamel on this ware is very handsome, and its purity and freedom from any injurious ingredient is absolutely guaranteed, and is vouched for after the most exhaustive analysis by several of the leading chemists in the country. This ware is quoted at discount 25 per cent. from list.

The Metal Manufacturing Company, of St. Louis, show in their advertisement on the 3d page a handsome cut of their Stone Iron Ware Pan, to which we invite attention. In addition to their assortment of Enameled Iron Ware they manufacture a large line of Pieced, Stamped and Japanned Tin Ware, Druggists and Grocers' Canisters, Oil Tanks, Shipping Cans and kindred goods.

C. E. Jennings & Co., No. 98 Chambers street, have been appointed sole agents for Smith, Collins & Kempton, manufacturers of Smith's Patent Mincing Knife. The entire production of these goods will in future be sold by their agents.

P. & F. Corbin have issued the following memorandum of changes in prices of some of their goods:

Attach to Price Book No. 8.

Office of P. & F. CORBIN,
NEW BRITAIN, CONN., Sept. 15, 1877.

GENTS: We have this day made the following changes in our prices, referring to our Price Book No. 8, viz.

	Dis. per cent.
Page 1 and 2, Wrought Brass Butt Hinges	75, net
" 2, Bronzed and Plated Shutter Hinges, No. 9, 19, 29 and 39	60, net
Page 5, Parliament Butts, No. 20	40&10
" 5, " " No. 21	55&10
" 5, " " No. 22	50&10
" 29, Japanned Screws	40&10

Pages 33 to 38½. Locks, Latches, etc. Change list. Discounts unchanged.

Locks and Latches.

No.	Per doz.	No.	Per doz.	No.	Per doz.
L o	$1.10	463	$4.50	871	6.50
53	15.00	465	4.60	875	8.50
75	2.65	465½	4.25	880	10.50
147, 2 ks	49.50	0465½	5.75	890	6.00
147, 4 ks	57.50	470	7.25	891	7.50
196	9.50	0470	10.00	895	9.50
219	20.00	470½	6.50	L 1170	2.30
241½	44.50	492	13.75	1175	5.00
245½	36.50	0492	15.00	1180	6.25
245¾	39.25	515	5.50	1185	7.25
270	17.62	516	7.00	1190	4.00
293	19.50	517	9.25	1195	6.50
294	25.50	520	6.75	1200	7.25
K 302½	2.00	521	8.25	1205	6.00
K 302	2.60	522	10.75	1445	16.00
426	9.00	636	19.50	1446	19.50
441	21.25	637	22.50	1450	22.50
460½	2.85	638	23.50	1451	24.50
0460½	4.25	640	23.50	1452	26.00
K 462	2.30	641	27.50	1453	30.50
462	3.00	870	4.50	1455	37.50

Door Knobs.

No.	Per doz.	No.	Per doz.	No.	Per doz.
800	$1.67	860	$9.00	956	$42.00
805	1.67	940	20.00	957	42.00
820	2.12½	954	35.00	958	38.50
825	2.12½	955	35.00	959	38.50
850	9.00				

Bell Pulls.

No.	Per doz.	No.	Per doz.	No.	Per doz.
1000	$2.50	1003	$7.00	1004	$7.00
1001	3.00				

Sliding Door Rail.

Iron, 1¼ inch ..... per foot, 6c.

Please mark the above changes in your book. No prices guaranteed.

P. & F. CORBIN.

Fernald & Sise, No. 100 Chambers street, have been appointed agents for Barnes' Duplex Corkscrews, which they quote at $4 per dozen, discount 50 per cent. This Corkscrew is simple, strong and durable; it is made of tempered steel wire extending through a solid metal handle, and is in reality two Corkscrews in one. It has two worms arranged one inside the other; the smaller or inside one projecting about three-quarters of an inch below the outer worm, is admirably adapted for drawing the corks of phials, while for large corks the screw is inserted until the outer or large worm is securely imbedded. They are neatly finished in nickel, packed in boxes of one dozen and in cases of one gross.

F. F. Adams & Co., Erie, Pa., have issued, under date of 15th instant, a circular calling attention to the reduction in prices on nearly all goods of their manufacture. The most important changes are the reduction in price of some of their leading styles of Clothes Wringers. Their No. 10 Keystone Wringer (regular family size) is now quoted at $57, formerly $63 per dozen; the No. 2½ Purchase Gear Wringer is now $60, formerly $66; No. 1 Wood Frame Wringer is reduced to $50, formerly $56; and the No. 2, Iron Frame Wringer, to $48, formerly $54 per dozen. We print below their revised price list, to which is added a discount sheet to apply to their price list of specialties in House-furnishing goods:

WHOLESALE PRICE LIST OF HOUSEHOLD GOODS MANUFACTURED BY F. F. ADAMS & CO., ERIE, PA., U. S. A.

Issued Sept. 15, 1877.

CLOTHES WRINGERS.

Keystone Wringers.—Wood Frame.	Size of Roll. Length	Size of Roll. Diam.	Retail price.	Wholesale, in any quantity, per doz.
No. 1, Usual Family Size, without Gears, with Set Screws	10	1¾	$7.00	$50.00
No. 10, Usual Family Size, Common Gears, with Set Screws	10	1¾	7.50	57.00
No. 2½, Usual Family Size, Purchase Gears, with Set Screws	10	1¾	8.00	60.00
No. 11, Large Family Size, without Gears, with Set Screws	11	1¾	8.00	57.00
No. 12, Large Family Size, Common Gears, with Set Screws	11	1¾	8.50	60.00
No. 14, Large Family Size, Purchase Gears, with Set Screws	11	1¾	9.00	65.00
No. 20, Usual Hotel Size, Common Gears, with Set Screws	11	1⅞	9.50	70.00
No. 22, Usual Hotel Size, Purchase Gears, with Set Screws	11	1⅞	10.00	74.00
No. 24, Large Hotel Size, Common Gears, with Set Screws	12	2	12.00	96 00
No. 26, Large Hotel-Size, Purchase Gears, with Set Screws	12	2	14.00	108.00
Iron Frame.				
No. 00, Small Family Size, without Gears, Self-Adjusting	10	1⅝	6.00	42.00
No. 2, Usual Family Size, without Gears, Self-Adjusting	10	1¾	7.00	48.00
No. 3, Usual Family Size, Purchase Gears, Self-Adjusting	10	1¾	8.00	57.00
No. 4, Large Family Size, without Gears, Self-Adjusting	11	1¾	8.00	57.00
No. 6, Large Family Size, Purchase Gears, Self-Adjusting	11	1¾	8.50	60.00
Walker Lever Wringers.				
No. 2, Usual Family Size, with Folding Bench	10	1¾	8.00	60.00
No. 4, Large Family Size, with Folding Bench	11	1¾	9.00	72.00
No. 6, Usual Hotel Size, with Folding Bench	11	1⅞	10.00	84.00

	Discount from List.
Lovell's Lock Hinge Step Ladder	60&10 %
Defiance Step Ladder	60&20 %
Extension Ladder	33⅓&5 %
Reversible Clothes Horse, Ash Timber, Patent Hinge	33⅓ %
Reversible Clothes Horse, Basswood Timber, Webbing Hinge	50 %
Hat and Coat Racks	50&10 %
Excelsior Clothes Horse, $12.00 per doz	10 %
Walnut Towel Roller, $4.00 per doz	30 %
Common Towel Roller, $2.50 per doz	10 %
Challenge Bed Spring, 50c. per slat	40 %
Common Ladders, 22c. per foot	25 %
Domestic Mop, $2.50 per doz	25 %
Victor Mop and Brush Holder, $3.00 per doz	25 %

Terms—Time, 60 days. Discount for cash, 2 per cent., if remittance is received within 15 days after date of invoice.

In making orders for Wringers always give list number.

Bissell, Welles & Millett, auctioneers, No. 15 Murray street, annnounce in their advertisement on the opposite page, another special sale of Hardware, Cutlery and House-furnishing goods, to take place on Thursday and Friday, 27th and 28th instant. On the last-named day they will offer a large line of Table Cutlery, including Silver Plated Table Knives and Forks, Carvers, Shears, &c., and in addition six cases of Pocket Cutlery, consisting of about 2000 dozen assorted patterns, besides Razors, &c., direct from bonded warehouse.

The Hardware Board of Trade (Limited) have just issued the following circular:

Office of the
HARDWARE BOARD OF TRADE (LIMITED),
Nos. 4 and 6 Warren street,
NEW YORK, September, 1877.

GENTLEMEN: This company having now been in active operation for less than four months, and already numbering more than 50 subscribers, asks your attention to its workings.

Our subscribers are made up of leading houses in the hardware, metal, cutlery, gun, iron pipe and kindred trades, from New York and also Philadelphia and Pittsburgh.

We furnish trade opinions and information as to the financial standing and condition of persons located in any part of the United States or Canada who purchase these classes of goods. Since commencing operations we have already made up several hundred of these reports, which are now on record here. We also give daily information of protests, failures and other matters of importance and interest to the trades represented, make collections and regulate compositions in bankruptcy.

Our object is the protection of these trade interests in every way, preventing as far as possible dishonest and irresponsible persons throughout the country from procuring goods in this market, and we ask your co-operation with us, believing that it will be greatly to your business interests, and we should be pleased to propose your name for membership.

The subscription price for one year is $50, which covers everything and entitles the firm to full privileges.

OFFICERS.

GEORGE S. CORBIN (of P. & F. Corbin), President.
GEORGE G. MOORE (of J. P. Moore's Sons), Secretary.
U. T. HUNGERFORD (of Wallace & Sons), Treasurer.
JAMES H. GOLDEY (4 and 6 Warren street), Actuary.
FREDERICK G. DOW (145 Broadway), Counsel.

BOARD OF DIRECTORS.

F. WIEBUSCH (of Wiebusch & Hilger Hardware Co.), U. T. HUNGERFORD, GEORGE S. CORBIN, GEORGE G. MOORE, JAMES E. POPE (of Thomas J. Pope & Bro.)

The Jacobus & Nimick Mfg. Co., of Pittsburgh, Pa., are erecting new buildings at Idlewild Station, seven miles from Pittsburgh, which they expect will be ready for occupancy by the 1st of November next. A description of their new factory will be found on the 24th page.

H. E. Russell, Esq., Treasurer of the Russell & Erwin Mfg. Co., arrived home with his family by the City of Berlin, on Saturday the 8th inst., from a residence of several years abroad, during which they have traveled through and resided in all the principal countries of Europe.

BRITISH IRON MARKET.

(*Specially reported by cable for The Iron Age.*)

WEDNESDAY, Sept. 19, 1877.

Scotch Pig.—The demand is steady and the amount of business fair. The following are makers' quotations:

Coltness No. 1	67/6
Glengarnock No. 1	60/
Eglinton No. 1	56/

Manufactured Iron and Rails are in the same condition as when last reported.

IRON.

American Pig.—The better feeling which we noticed in our last report of the Iron market has been steadily maintained and we think strengthened during the week. There is a decided improvement in the demand, which is strictly confined to moderate sized lots for early delivery. Thus we hear of several parcels of 50, 100 and 200 tons different brands finding purchasers at about our quotations. Sales during the week amount to about 1200 tons No. 1, and 1000 tons No. 2. There is an entire absence apparently of anything speculative in the market, and as all the Iron selling now is to satisfy the present requirements of consumers, and as the inquiries from this class are steadily increasing, the makers naturally feel more hopeful for an early resumption of active business than they have had reason to feel in a long time. We quote: Foundry No 1, $18 @ $19; Foundry No. 2, $17 @ $18; Gray Forge, $16 @ $17.

Scotch Pig.—The demand for Scotch Iron does not seem to improve in the slightest degree. Small parcels of 10, 20 and 30 ton lots have been sold at our quotations, but no round lots have changed hands during the week, and as a gentleman interested in this branch of the trade expressed it, "there is no vim to the market." There have been no arrivals at this port since our last writing. We continue to quote: Glengarnock, $25 @ $25.50; Eglington, $24 @ $24.50; and Coltness, $26.50 @ $27.

Rails.—Nothing has transpired in this market during the week either in Steel or Iron Rails. We hear of some large transactions in Iron Rails in the West believed to be for export. We quote as before: Iron, $33 @ $38, and Steel $45 @ $47, both at mill.

Old Rails.—There is nothing doing, although we hear of some inquiry and considerable difference between the views of buyers and sellers. We quote $19, which is the nominal price.

Scrap.—No sales are reported. We continue to quote No. 1 Wrought from yard $22 @ $23.

Manufactured Iron.—The demand for all grades of Manufactured Iron is light and unsatisfactory, The trade in Irons used for building purposes is almost at a standstill. During the week no contracts that we could learn of have been made. The stocks of Merchant Bars, although not as heavy as we have seen them in years gone by, are well assorted and ample for all the requirements of the trade. Refined Iron, ordinary sizes, is quoted at 2c. @ 2.1c., according to quality, and Common Iron, 1.7c @ 1.9c. Swedish Iron, ordinary sizes, sells in a small way at 6c, currency.

METALS.

Copper.—The sale for export of about 4,500,000 pounds Lake Copper to which we alluded in our last report, has since been confirmed, and there have been sold besides 1,000,000 pounds on the spot and "futures" at 18c. @ 18½c., the market closing tolerably firm at the latter figure. Of Baltimore 100,000 pounds sold at 18½c. There is now but little available Copper left; on the other hand, manufacturers have laid in a supply, and the market relapses into quietude. Whether the present price of 18½c. can be sustained in the immediate future, depends on circumstances. If the amount recently taken for export had been larger, it would have been all the better for holders on this side, and unless manufacturers are soon compelled to re-enter the market, it may ere long become necessary to export more Copper in order to furnish additional relief, and prevent an accumulation of stock among us. According to the latest telegrams from London, Best Selected has declined to £74. 10/, and Chili Bars have gone off to £67, a giving way of 10/ in both sorts. The manufactures of Copper and Yellow Metal are in steady, moderate demand at the prices before current; we quote New Sheathing Copper, 28c., and Bolts and Braziers, 30c.; Yellow Metal Sheathing 20c. for Domestic and 16½c. for English; Yellow Metal Bolts, 25c., and Nails, 20c., all net cash.

Tin.—Our market has become somewhat stronger, consequent upon certain Boston lots of Straits being out of the way, and the quantity on hand and afloat now being moderate. For Straits Tin, 15½c. @ 15¾c., gold, is now obtainable in large lines, and for Banca, 17½c. @ 17¾c., gold. Straits at London has recovered £1, and is wired £65, while Singapore cables $19.25, with an exchange of 3/11½. The same cable dispatches inform us that the shipments from Singapore during the first fortnight of September amounted to 140 tons. It is furthermore announced that the Netherland Trading Society will sell on the 26th instant, at public auction, at Rotterdam, 21,700 slabs Banca, and 3500 slabs Billiton Tin. We have been shown two private letters to an East India firm here, from which we make the following extracts: Singapore, August 3: "Scarcely anything is being done for America or England, and it looks as if for July and August you must depend solely on Australia. The advices we get from that quarter lead us to think that at present prices production will decrease, but that at somewhat higher values large supplies will come in. Here and in Penang we have had a very brisk demand for China, which has taken off about 7000 piculs." London, September 8: "Tin is pretty steady at £63. 15/ to £64 for Australian, and £64. 15/ to £65 for Straits. We understand that shipments of the first named are likely to be light for the next three months, and we look for a gradual improvement in the statistics of the metal." The market closes with considerable strength as follows: Straits, 15⅝c. @ 15¾c., gold; English Refined, 15¼c.; do. common, 15c.; Australian, 15¾c., and Banca, 17¾c. @ 18c., all gold. *Tin Plates.*—There is a fair jobbing demand. We quote toward the close, in gold, per box, ordinary brands, large lines: Charcoal Bright, $6.44 @ $6.62½; Ternes, $6 @ $6.25; Coke Tin, $5.65 @ $5.75, and do. Ternes, $5.37½ @ $5.62½.

Lead.—The only sale we hear of since our last report is one effected early in the week of 100 tons Common Domestic at 4¾c., currency, October delivery; Soft Missouri is quoted $4.80 @ $4.90, currency, nominally. Between holders and consumers the position of the metal is now reduced to a struggle of patience; if the former can manage to remain firm a little while longer, they may finally coerce the latter into resuming operations under the pressure of urgent requirements, and we may then witness a sudden rebound, to which a metal like Lead is liable when depressed beyond measure. In Europe such a favorable reaction took place yesterday, when London (as per cable) advanced between 5/ and 7 6 per ton, Spanish now costing £19. 17 6, cost, freight and insurance. The fact seems to be, on the one hand, that with the Spanish export duty in operation the intrinsic value of Lead from the Peninsula will be that much higher, and on the other, that the probable indefinite prolongation of the war in the East will oblige the belligerents to resume purchases of Lead before the approach of the winter months. Hence the renewal of an upward tendency on the other side. Manufactured is in steady, fair demand at unchanged prices. We quote: Bar, 7c.; Pipe, 7½c.; Sheet, 8c.; and Tin-lined Lead Pipe, 15c., all less 10 per cent. to the trade.

Spelter and Zinc.—Domestic Spelter remains inactive but firm at 5⅞c. @ 6¼c., currency, as to brand, while of Foreign there is none here and none expected that we hear of. Consequently it is altogether nominal. While on the continent the late activity has been followed by a pause, England now begins to look up again. *Sheet Zinc.*—Sheet is very quiet, but prices are unchanged. We quote Mosselmann 8c. @ 8½c., gold, and Domestic 7⅜c. @ 7½c. currency.

Nickel.—We hear of a steady, moderate business at well-sustained rates within the range of $1.70 @ $1.85, gold.

Antimony.—Continues in request, and with the light stock we have got and the little on the way, 12c., gold, is now insisted upon, while London, though unaltered, maintains the same stiff attitude.

EXPORTS

Of Hardware, Iron, Machinery, Metals, &c., from the Port of New York, for the Week ending Sept. 18, 1877:

Hamburg.

	Quan.	Value.
Hdw., cs.....	179	$4,960
Sew. mach., cs	791	22,813
Ag. imp., pkgs	46	4,378
Spelter, slabs	1646	4,873
W'shade fix..cs	9	825
Lamps, pkgs..	1	100
Pumps, pkgs..	18	900
Belting, cs.....	7	2,823
C'ge mtls., pgs	12	250
Mach'y, cs....	23	2,997
Copper, cks..	90	23,000
Gas fixt., cs...	7	92
Mf. iron, pkgs	21	429
Clocks, bxs...	69	1,113
Wringers, cs..	10	300

Bremen.

Hdw., cs	18	404
Pumps, pkgs..	7	500
Tinware, pkgs	4	162
Ag. Imp., pgs.	7	592
Wheels, ...	21	100
Pl't'd ware, cs.	4	200
Lamps, cs.....	7	450
Vent'lors, case.	1	100
Mach'y, case.	1	150

Antwerp.

Hdw., cs.....	21	980
Sew. mach., cs	101	1,040
Mach'y, pkgs	4	2,500

Rotterdam.

Pumps, pkgs.	27	1,600
Copper, pcs...	73	2,050
Plum. mtls., cs	4	318
Mf. iron, pkgs.	7	240
Ag. imp., pkgs.	3	200
Hdw., cs.....	23	1,203
Mach'y, cs....	3	200

Liverpool.

Saws, pkgs....	2	500
Sew. mach., cs	14	361
Ag. imp., pkgs	24	765
Belting, cs....	2	264
Wire, pkgs....	1	125
L'p g'ds., pgs.	26	600
Clocks, bxs...	717	13,435
Hdw., cs.....	22	2,250
Metal g'ds, cs.	6	1,131
C'ge mtls., pgs	14	440
Mach'y, pkgs.	9	2,165
Cop. plates, cs	62	7,947
Plu. mtls., pgs	4	350

London.

Clocks, bxs...	556	8,108
Sew. Mach., cs	470	7,821
C'ge mtls., pgs	54	2,420

Cuba.

Iron plates...	47	313
Cutlery, bxs...	3	70
Coal, tons.....	397	1,862
Sew. mach., cs	21	459
Machy., pkgs.	1,195	27,513
Hdw., pkgs...	82	1,876
Plu. mtls., pgs	9	244
Mf. iron, pkgs.	25	182
Pumps, pkgs..	8	450
Brass tubes, cs	3	373
R. R. bars.....	1201	3,419
R. R. mtls., pgs	606	6,289

Argentine Republic.

Pl't'd ware, cs	1	70
Hdw., cs.....	258	4,957
Ag. imp., pkgs	126	2,480
Cr'ge mtl., pgs	5	100
Clocks, pkgs..	29	1,982
Mf. iron, pkgs	12	190
Vent'lors, pgs.	2	75
Lamps, pkgs..	22	1,167
Cutlery, pkgs.	20	194
Sew. mach.. cs	144	1,987

Danish West Indies.

Nails, kegs....	104	313
Tinware, bxs.	9	138
Hdw., pkgs...	115	1,421
Clocks, cs.....	12	191
La'p g'ds, pgs	40	633
Pl't'd w're, cs.	4	120
Pumps, pkgs..	2	77
Arms, case...	1	79

Canada.

Lamps, pkgs..	3	132

British Australia.

Nails, kegs....	420	1,270
Clocks, cs.....	383	6,124
Tin, cs.....	6	40
Pl't'd ware, cs	4	648
Am'nition, cs.	1	102
Pumps, pkgs.	12	612
Burners, cs....	21	751
C'ge. mtl., pgs	149	4,650
Ag. imp., pgs.	93	2,313
Lamps, cs....	8	250
Mach'y, cs....	133	5,550
Sew. mach., cs	34	8,553
Gas fixt's, pgs	14	3,804
Mf. iron, pkgs.	624	3,185
Wringers, cs..	20	531
Cartrid, e's, cs.	4	453
Hdw., pkgs.	1,051	23,029
Belting, box.	1	465

Alexandria.

Clocks, bxs...	10	220

Hull.

Brass g'ds, bxs	2	250
Clocks, bxs...	68	784
Car wheels....	28	147
Mach'y., bxs...	4	3,049

Glasgow.

Mach'y, pkgs.	15	$1,450
Ag. imp., pge.	1	76
Clocks, bxs..	468	6,595
Hdw., cs.....	2	109
C'ge mt. pkgs.	3	94

Havre.

Mach'y., cs....	2	150
Ag. imp., pgs.	28	1,840
Copper, bbls..	143	35,750
Mf. cop'r, cs..	1	150

New Zealand.

Hdw., cs.....	95	4,920
Nails, cs.....	104	1,856
Clocks, pkgs..	161	1,850
Cutlery, pkgs.	299	3,200
Ag. imp., pgs.	656	16,541
Sew. mach., cs	35	2,300
Wringers, cs..	7	260
Mf. iron, pkgs	23	220
Belting, cs....	2	750
Pumps, cs....	31	1,375
C'ge mtl., pgs	263	4,681

Brazil.

Clocks, bxs...	69	1,400
Cutlery, cs...	157	3,340
Irons, bxs.....	58	354
Brit. w'e, pgs.	3	221
Hdw., cs.....	160	1,831
Lamps, pkgs..	24	706
Ag. imp., pkgs	8	127
Mf. iron, pkgs.	30	593

Venezuela.

Hdw., cs.....	154	2,387
Nails, kegs....	29	87
Clocks, bxs...	7	183
Revolvers, box	1	157
Mach'y, cs...	1	101
Tacks, cs.....	2	23
Lamps, pkgs..	198	3,368
Mach'y, pkgs.	1120	27,342
Sew. mach., cs	15	454
Mf. iron, pkgs.	22	476
Needles, cs...	1	69

French West Indies.

Tinware, cs..	1	16
Pl't'd ware, cs	2	154
Nails, kegs....	4	13

British North American Colonies.

Mf. iron, pkgs.	6	134
Coal, tons.....	55	220

British West Indies.

Grindstones...	36	183
Nails, kegs....	30	87
Tinw're, pkgs.	4	94
Hdw., pkgs...	15	421
Mf. iron, pkgs.	15	195
Mch'y, pkgs..	144	1,025

British Possessions in Afria.

Pumps, bxs..	9	422
Ag. imp., pgs.	388	8,484
Nails, kegs....	70	248
Hdw., cs.....	116	3,120
H. shoes, kgs.	36	146
Scales.....	9	288

Porto Rico.

Ag. imp., pgs.	8	181
Mach'y, pkgs.	8	624

China.

Pumps., pkgs.	3	200
Revolvers, cs.	8	400
Hdw., pkgs...	13	407
Belting, bale..	1	37
Mach'y, cs....	22	8,020
C'tridges, cs...	592	14,060

Hayti.

Nails, kegs....	25	78
Hdw., pkgs...	10	71
Mf. iron, pkgs.	1	170
Rifles, cs.....	5	1,680

Mexico.

Ag. imp., pgs.	11	230
Hdw., pkgs...	299	3,637
Mach'y, pkgs.	76	5,023
Lamps, pkgs.	17	417
Revolvers, cs..	1	520
Burners, cs...	2	394
Sew. mach., cs	232	4,657
Mf. iron, pkgs	67	844
Cutlery, bxs.	4	542
Clocks, cs....	6	170
Springs, bxs..	121	2,019
Pumps, pkgs.	4	144
Cartridges, cs.	2	116
Gas fixt., bxs	4	866
Carbines, cs..	1	160
Nickel, cs.....	1	158

United States of Colombia.

Sew. mach., cs	98	3,801
Ag. Imp., pgs.	27	1,055
Arms, cs.....	13	1,544
R. R. car.....	1	275
Wire, coils...	358	2,905
Cutlery, pgs..	98	2,524
Hdw., cs.....	225	7,920
Nails, kegs....	15	59
Clocks, pkgs..	6	451
Rev'lvers, bxs	4	581
Shot, kegs...	22	154
Mach'y, cs...	303	26,283
Cartridges, cs.	25	1,107
Iron, pcs.....	40	318

IMPORTS

Of Hardware, Iron, Steel and Metals into the Port of New York, for the Week ending Sept. 18, 1877:

Hardware.

Boker Hermann & Co.
Razors, cks., 2
Cutlery, cs. 2 ; cks., 9
Scissors, cs., 1
Casks, 8
Guns, cs., 3
Files, cks., 4
Brokhahme Wm.
Cutlery, cs., 1
Friedmann & Lauterjung,
Cases, 3
Howard, Sanger & Co.
Cases, 7
Harrison Bros. & Howson,
Cutlery, cs., 3
Laszk A. D.
Revolvers, cs., 1
Moore's J. P. Sons,
Mdse., cs., 1
Gun wads, cs., 2
Mason J. W. & Co.
Wire rope, coils, 18
McCoy & Co.
Cases, 8
Mdse., pkgs. 17
Morris L. W.
Cutlery, cs., 1
Nichols & Lefever,
Arms, cs., 2
Siegmann Bros.
Cases, 2
Schoverling & Daly,
Arms, cs., 11
Tomes F. & Co.
Case, 1
Wiebusch & Hilger Hdw. Co.
Hdw, cutlery & r zor hones, pkgs., 31
Wright Peter & Son,
Gun barrels, cs., 1
Order,
Cartridge cases, 6
Cases, 5
Casks, 1
Wire rope, coils, 1

Iron.

Bartlett & Pond,
Scrap, chains, 2
Brown A. S.
Scrap, tons, 18
Henderson Bros.
Pig, tons, 52
Hamlin J. H. & Sons,
Scrap, tons, 30
Naylor & Co.
Bars, 2043
Panama R. R. Co,
Scrap railroad, tons, 695
Scrap, tons, 119
Phelps, Dodge & Co.
Sheet, bdls., 15
Sampson Geo. G.
Pig tons, 100
Order,
Pig, tons, 100
Bundles, 50

Steel.

Bingham Wm. & Co.
Cases, 16
Prosser Thos. & Sons,
Tire forgings, 34
Woodford W. O
Cases, 6
Bars, 9
Bundles, 158
Order,
Casks, 24

Metals.

Bruce & Cook,
Tin plates, bxs., 1133
Byrne Joseph & Co.
Tin plates, bxs., 548
Cort N. L. & Co.
Tin plates, bxs., 2609
Dickerson, Van Dusen & Co.
Tin plates, bxs., 2516
Drexel, Morgan & Co.
Tin slabs, 225
Knoblauch & Lichtenstein,
Tin slabs, 890
Lee & Sturges,
Zinc, cs., 3
Lamarche H.
Zinc, rolled, cks., 25
Middleton & Co.
Scrap metal, bxs., 2
Merchants' Bank of Canada,
Tin slabs, 167
Naylor & Co.
Tin plates, bxs., 1454
Phelps, Dodge & Co.
Tin plates, bxs., 3805
Black taggers, bxs., 17
Palmer & Skelton,
Tin, rolls, 1
Tuclon Co.
Tin slabs, 500
Order,
Tin plates, bxs., 5769
Terne plates, bxs, 100
Black taggers, bxs., 165
Tin slabs, 617

COAL.

The condition of the Coal trade has undergone very little change since our last issue. The warm weather has kept buyers out of the market to some extent, and prices have not advanced as was anticipated by some, quotations being the same as last week. Those who have Coal have all that they can do, and it is reported that the Philadelphia and Reading have more orders than they can fill. More Coal is coming to market this week than last, and from many of the regions there is a considerable excess of this year's production over last. The uneasiness among the men seems to be increasing ; the operators are as a general thing reported firm. In speaking of the prospect for the season Mr. Saward says: "The Lehigh region have adjusted their difficulties, and are paying on a 'basis,' September wages being 12½ per cent. over the rate for July. Consumers and all concerned should bear in mind that September is usually one of the months of the year in which the heaviest Coal tonnages are forwarded, and the present output being much less than usual, there is not the opportunity for the reduction in price to anything like the figures ruling before the July riots."

OLD METALS, PAPER STOCK, &c.

We have no perceptible improvement to report in the condition of the Old Metal market. There has been a slight call for Cast Iron, but other stocks are in little request. Copper, Brass, Composition and Lead are all in a weak condition, and prices favor buyers. Wrought Iron is in moderate demand and is selling at reduced figures. Rags and Paper stock continue dull and declining, and the market is weak at our quotations.

The purchasing prices offered by dealers for Old Metals are as follows:

Copper	$0.13	@	$0.14 per lb.
Yellow Metal	.10	@	.... "
Brass, heavy	.09½	@	.... "
Brass, light	.08½	@	.... "
Composition, heavy	.11½	@	.... "
Lead, solid	.04	@	.... "
Tea Lead	.03½	@	.... "
Zinc	.03½	@	.... "
Pewter, No. 1	.13	@	.... "
Pewter, No. 2	.08	@	.... "
Spelter	.05¼	@	.... "
Wrought Iron	17.00	@	.... per ton.
Light do	12.00	@	.... "
Stove Plate	9.00	@	.... "
Machinery do	12.00	@	.... "
Burned Iron	4.00	@	.... "

The prices current for Rags, &c., are as follows:

Canvas, Linen	4½c.	@	5 c.
" Cotton, No. 1	5½c.	@	
" " No. 2	2½c.	@	
White No. 1	5 c.	@	....
" No. 2	3 c.	@	....
Colored do	2 c.	@	....
Mixed, Woolen	2 c.	@	3 c.
Soft, do	5½c.	@	6 c.
Gunny Bagging	3 c.	@	....
Jute Butts	2¾c.	@	....
Kentucky Bagging	3 c.	@	....
Book Stock	2½c.	@	....
Newspaper Stock	2 c.	@	2¼c.
Waste Paper and Scraps	1¼c.	@	....
Kentucky Bale Rope	4 c.	@	....
Cakum Junk, No. 1	4½c.	@	5 c.
" No. 2	3 c.	@	....
Tarred Shaking	1 c.	@	1¼c.
Grass Rope	3 c.	@	3¼c.

PHILADELPHIA.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, September 18, 1877.

The condition of business continues to improve slowly but steadily, and the confident feeling in regard to the future is general in all departments of trade. In some branches there is a fair degree of activity already, but as a rule anticipation is more general than reality. There are many branches connected with the Iron interests that are still greatly depressed, while others are beginning to realize a decided improvement, and it is doubtless simply only a question of time when it will pervade other departments as well as those already benefited.

After looking carefully over the condition of the Iron trade, we think it will be found that its position is much stronger than might be supposed after such a protracted depression. Some of the leading features are indicated under the various articles reported below, but in a general way the outlook is very favorable, and if any increase in the demand should come soon, buyers will find themselves at a considerable disadvantage. Almost every article on the list is scarce and prices gradually hardening, and all that is needed to secure a sharp advance is just to set the ball in motion. It may be some time yet before the first impulse is felt, but when that time arrives there will be plenty of trade.

Pig Iron.—The market is in a very unsettled condition, and it is a difficult matter to report it with exactness. Opinions are so varied and statements so contradictory, that it might be supposed the market was both strong and active and at the same time dull and depressed, and in some degree such is the case. Good brands of Foundry Iron are selling very freely at full prices; that is, there are numerous orders for small lots, quick delivery, and to such an extent that the furnaces are sold close up and are barely able to supply the demand. On the other hand, there are no buyers for large lots, from which it is inferred that consumers have no important orders on hand, and that the present activity is only temporary. This may or may not be true, but it is probable that the movement may gradually develop into a larger business. There is nothing certain about it, however, and the most experienced men in the trade express their entire inability to form any definite opinion in regard to the future, although as a rule the indications are regarded as being favorable. Besides the difficulty of placing large lots, we may state that in several instances within our own knowledge, buyers who made contracts for delivery during the fall, find themselves unable to take the Iron as agreed upon, giving as a reason that they cannot find a market. From this it will be seen that there is a good deal of uncertainty in regard to the future, which may be dissipated, however, as the season advances.

The statistical position of the trade seems to be good, and, carefully considered, shows a better state of affairs than is generally supposed to exist. From the fact that only about one third of the furnaces are being operated, it might be inferred that the consumptive demand was only equal to about one-third of the capacity for production. This is certainly an error. In the first place, it will no doubt be shown that the 675,000 tons stock on hand at the close of 1876 has been largely drawn upon, in which event the actual consumption has been to that extent in excess of production. Then the idle furnaces, numbering two-thirds of the whole, do not by any means represent a capacity to increase production in that proportion. In point of fact, we think it will be shown that a full half of the total productive capacity of the country has been utilized during the current year and the consumption at least 60 per cent. of the total capacity. An addition of probably 15 to 25 per cent. might be made to production in competition with the furnaces now in operation, but the balance being of small capacity and expensive to operate, or badly located, are practically out of the market. It must also be remembered that even the largest and best furnaces cannot always be in operation, accidents and repairs and various contingencies have to be provided for, so that when consumption has to be met by actual production, it will be found the capacity is not so disproportionate as is generally supposed.

In the meantime, buyers are quite apathetic, and the general condition of business much the same as last week. We notice a considerable scarcity of Old Rails, which if continued may have an important effect on the market for Pig Metal. We quote prices as before, with a few sales in round lots at inside figures and numerous small lots at the outside rates: No. 1 Foundry, $18 to $19; No. 2 Foundry, $17 to $17.50; Gray Forge, $16.50, with special brands held at $1 to $1.50 per ton more. We also note a sale of 700 tons Mottled Iron at $14.20 at furnace.

Plate and Tank Iron.—There is a somewhat better demand in a small way, but no orders for large lots are reported. There are the usual complaints of the business being unprofitable, and a slight tendency toward higher prices. Buyers for round lots, however, are anxiously sought after, but there is no disposition to take hold in advance of requirements. We quote the market quiet and steady at late rates, as follows: Ship Plates, 2.37½c. to 2 50c.; Tank Iron, 2⅝c. to 2⅞c.; Shell Iron, 3c.; Flange Iron, 4c. to 4½c., and Best Bloom, 5½c. to 6c.

Sheet Iron.—The demand throughout the week past has been unusually satisfactory, and orders are now of a more important character than for a long time past. The movement appears to be based upon actual requirements, and, as was indicated in our last week's report, the mills are realizing the full benefit of an active demand. The natural result of a better trade is seen in prices, which are strong, with an upward tendency. We continue our last week's quotations, which, however, are only for large quantities, and ⅛c. to ¼c. additional is obtained for small lots. Refined Sheet Iron, No. 26 to 28, 3¾c.; No. 22 to 24, 3½c.; No. 16 to 21, 3¼c.; Best Bloom Sheets, No. 26 to 28, 5½c.; No. 22 to 24, 5¼c.; No. 16 to 21, 5c.; Common Red Plates, 5-16 to 18, 2⅝c. to 2½c.; Refined Plates or Blue Annealed, 5-16 to 18, 2¾c.; American R. G., 5-16 to 18, 3¼c.; Best Bloom, 5-16 to 18, 5c.; A. Patent Planished, 11c.; B. Patent Planished, 10c.; Bloom Galvanized, 40 per cent.; Refined Galvanized, 50 per cent.

Bar Iron.—There are almost as many complaints as ever, both in regard to demand and price. Little or no improvement has been experienced in this branch of the Iron trade, but there is a better feeling in regard to the future, and it is expected that a change for the better will be realized in common with other departments of business. Some quite large orders have been placed during the past few days for various specialties, chiefly in connection with bridge work, and as there are other inquiries, it is expected that some of the mills which were getting to the end of their contracts will again secure sufficient business to occupy them well on to the close of the year. The demand for Merchant Bar is very languid, however, and prices are as unsettled and irregular as ever, although strictly first-class brands are still held at full prices. We quote: Common Iron, 1.60c. to 1.75c., and Best Refined, 2c. to 2.1c.

Steel Rails.—Confirming our report of last week, we have to state that some large sales have been effected withing the past few days. What the prices actually were it is difficult with absolute certainty to state, but they were undoubtedly the lowest that have ever been known. On good authority we have been informed that $42 to $43 was about an average, but it is believed these figures included delivery at tide-water. The market is a good deal firmer at this writing, and we are told by one of the companies that they have refused several orders to-day at a considerable advance in price over the sales of last week. The low prices, as well as the necessities of some roads, have brought a number of buyers into the market, and the immediate outlook indicates a large business and greater steadiness in prices. The Steel Rail trade seems to have touched bottom for the present, and with plenty of orders on hand they are not likely to make further concessions. We quote, $44 to $45, delivered at tide-water as the nominal rates of to-day.

Iron Rails.—There have been but few sales during the week, and in most cases they were small lots. There are some further inquiries, and it is probable that contracts will be closed in course of a few days. The general condition of the trade, both as to price and demand, is about as last reported. We quote on a basis of about $31 to $35 cash, at mills, according to section and quality.

Old Rails.—There has been quite an active demand for some days past, but the market is bare of stock, and no recent transactions are reported. Holders of lots at a distance are much firmer in their views and seem likely to control the market. The supply for some time past has been large, and the low prices induced parties to purchase heavily, but the article appears to have all gone into consumption; in fact Rails have become a staple article, and materially influence values of all the leading Iron products, so that a continued scarcity means an increased consumption of Pig metal and an increase in the cost of Manufactured Iron. The scarcity may be only temporary, however, but in any case prices seem to have touched bottom. Latest sale in this market was at $18.75; the nominal rate to-day may be quoted $19.50 to $20.

Old Car Wheels—Are scarce and wanted. We hear of one sale during the week at $19, with buyers for more at same price.

Old Car Axles.—The demand is not very active, and prices are rather weak. Only one sale is reported, and that at an inside figure. We quote $26 to $28, according to make.

Scrap Iron.—There is a better demand for all grades, and sales have been made at something beyond our extreme quotation. The market is firm at $15 to $16.50 for Cast, and $22.50 to $23.50 for Wrought.

Scrap Steel—In fair demand at about $40 to $42.

Nails.—The demand keeps up well, and the market is firm and steady. Stocks are down to a low point, and manufacturers are not disposed to make any concessions or to enter orders much in advance. There is to be a meeting of the association to-morrow, but it is not likely any change will be made in prices. We quote as before, $2.40 to the trade and $2.50 to consumers.

Lead.—There is no improvement to note either in price or demand, and we quote 4.80c. to 4.90c., nominal, for Domestic. The activity noted in the manufactured article and in Shot is fully maintained, and there is every prospect of an unusually large trade this fall. We quote: Bar, 7c.; Pipe, 7½c., and Sheet, 8c.; Shot—Drop, 8¾c. to 9¾c.; Buck, 9¾c. to 10¾c., all less 10 per cent. to the trade.

PITTSBURGH.

Office of *The Iron Age*, 77 Fourth Avenue, PITTSBURGH, Sept. 18, 1877.

There has been an improvement in general business during the past week, and a more cheerful feeling prevails; it begins to look as if we were destined to have a fair fall trade, and it is hoped that our manufacturers, in addition to an increased demand for their products, will be able to realize more remunerative prices. Herein lies the great source of complaint at the present time; prices, in consequence of an active competition produced by overproduction, have been cut to such an extent that there is very little, if any, margin for profit.

Pig Iron.—There is an increasing demand, but the inquiry is still for small lots to supply immediate wants. There is an entire absence of anything like speculation, and consumers refuse to anticipate future wants, unless they are offered strong inducements in the shape of very low prices. Some of our mill men are on the alert for bargains; they are ready to take hold when those whose financial necessities oblige them to sell are on the market, and they can obtain a round lot at a dollar or two per ton below current rates. Some few sales of this kind have been made recently, but no one, excepting those whose circumstances make it necessary, are willing to make any further concessions, that is for good brands. As prevailing prices scarcely cover actual cost of production, there is no room for any further reduction in prices, and it is not likely that the market, in a general way, will rule any lower, although it is but proper to remark in this connection that there is not much prospect apparent at present of any immediate advance. Strictly first-class red-short Mill Iron may be quoted at $21, 4 mos., commoner qualities, $19 to $20; cold-short and neutrals, $17.50 to $19; No. 1 Foundry, $22 to $22.50; No. 2, $21 to $21.50. Very few of the mills are buying more than 50 or 100 tons at a time, while foundry men are buying from 10 to 30 tons.

Manufactured Iron.—The situation has changed but little since date of our last report; business is still considerably depressed. Orders are not coming forward as freely as could be desired by any means, and the fact that the most of our manufacturers have stiffened up in their prices has not been without its effect in restricting trade, as orders have no doubt been placed elsewhere in consequence. However, there is a firmer feeling being developed at all points in the West, particularly since the taking of stock, and as the feeling is gaining ground that hard pan has been reached, and stocks both in the hands of jobbers and consumers are known to be comparatively light, an increased volume of business within the next week or two is not improbable. It is about as certain as anything can be that the cost of production has been reduced to the lowest limit; very few consumers even expect Pig Iron to rule any lower; labor is down to the bottom notch and coal is higher, and this being the case it is not reasonable to look for any further shrinkage in the value of finished Irons. We continue to quote at 1.80c. to 1.90c. for Bars, and some few makers are refusing to book any orders under 2c.

Nails.—The regular monthly meeting of the Western Nail Association took place in this city last Wednesday. It was generally expected that prices would be advanced, but it was the sense of the meeting that no change for the present was advisable, and it is not likely, as the busy season will be over before the next regular meeting, that there will be any change made now until the spring trade opens up. There is a fair business, but orders are not coming forward as freely as expected or usual at this season of the year; and, moreover, makers complain that there is no margin for profit at current rates. Nearly all the factories, with the exception of Jones & Laughlin, are running, and while some have orders about sufficient to absorb their production, others are piling up; $2.25, 60 days, with 2 per cent. off for cash, is the ruling rate for 200-keg lots and upward. Since the above was written your correspondent has learned that a $2.15 card has been sent out by some of the Wheeling makers, with 10 cents per keg off for 200-keg lots and upward, and 2 per cent. discount for cash. The sending out of this card, pulling prices away down below actual cost of manufacture, was occasioned by a fight between two of the Wheeling mills, but if it is persisted in, manufacturers will be obliged to meet the reduction or quit selling. It is probable, however, that as the fight is sharp it will soon be brought to a close, and the sooner the better.

Horse and Mule Shoes.—There is a fair business but no change in prices. Shoenberger & Co. continue to quote 100-keg lots at $3.80 and $4.80. Special rates given for larger lots.

Wrought Pipe.—The Lap-Welders' Association remains intact and the association rates are closely adhered to; but with the Butt-Welders it is different. While the association of the latter is still in existence, the members are allowed to meet competition. It appears there were those in the business who refused to go into the association or be governed by the association rates; they made it a rule to act under the association discounts in order to attract, and it is the intention of the association to give these scalpers the benefit of low rates. The Lap and Butt-Welders are two separate and distinct associations, entirely independent of each other, although some firms make both.

Steel.—Nothing new to report. Business continues fairly active. Mills are all busy, but complaint is made that there is little or no margin for profit at current rates. As noted in a former report, however, the very low prices have been the means of largely increasing the consumption, and at the same time preventing the importation of foreign Steel.

Scrap.—The movement in all kinds of Scrap continues light and prices remain unchanged. Old Rails, $19 to $20, 4 months. There is a great difference in the quality of Rails, and it is complained that it is difficult to obtain a lot running uniform. Hence they are hard to dispose of, notwithstanding they are so much cheaper relatively than Pig Iron. Old Car Wheels still quoted at $20 to $21 per gross ton, and No. 1 Railroad Scrap at $24.

Window Glass.—Some of the factories have been started up, and it is probable they will all be in operation between now and the close of the month. Business is fair and manufacturers hopeful. No change in rates —70 off by the car load and 60 and 10 to 60 and 20 for smaller lots.

Petroleum.—The most important matter to report is a rumor, which appears to be generally believed, that the hitch between the Standard Oil Company and the Pennsylvania Railroad Company is in a fair way for settlement. The effect of this will be to wind up the Empire Oil and Transportation Company, which was the great bone of contention. It is said that the Pennsylvania Railroad Company has arranged to take the rolling stock of the Empire, the Standard its pipe lines, tanks and oil; and probably the control of the refineries of the Empire will pass to the Standard. It has been suspected by the knowing ones that the Standard would get away with the Empire as it did with the Prentice some time ago; and, moreover, the wiping out of the Empire may be taken as a victory of the Standard over the Pennsylvania Railroad, the former company appearing to have dictated the terms. It was well known that the Standard could do without the Pennsylvania Railroad better than the Pennsylvania Railroad could do without the Standard.

CLEVELAND.

CLEVELAND, September 18, 1877.

Iron Ore.—The sales of Lake Superior Ores have not increased since our last report, and the receipts are largely in excess of the demand. A large number, possibly a majority of the working furnaces dependent upon Lake Superior Ores, are running upon stocks purchased from day to day. The long-standing custom of making contracts for a twelve months' supply ahead, has been this year discarded by all but a few of the furnace owners. They have not cared to go into an unpromising future with large supplies upon their hands, and small orders for their products. This policy has made it necessary for the ore companies either to reduce their work, or to bring their ores into this market unsold. It is a lamentable fact that in too large a number of cases the latter dilemna has been chosen. The railroad docks are now over-burdened with ore, and are without immediate prospects of being relieved. Furnaces cannot afford to buy ore in the present condition of the Pig Iron trade.

Pig Iron.—This, while it is more active than a fortnight since, is still in a depressed condition. The mills are not using much, still continuing to find Scrap more economical. The foundries are not busy, and the consumption of Pig Iron is confined mostly to the Steel makers, whose business continues good.

Bar Iron and Nails.—There is a very active trade in Bars, and the same may be said of Nails. Dealers and manufacturers are less disposed to make concessions to obtain orders, which are now coming in about as fast as they can be cared for by the mills in this vicinity.

Scrap Iron and Rails.—The demand for both these is exceedingly active, and prices are on the mend. Both Scrap and Rails have advanced in price, and the demand is considerably in excess of the supply. Prices range from $21.50 to $23.

BOSTON.

SEPT. 15.—*Iron.*—Pig is a trifle steadier. The New York quotation for No. 1 Foundry is $18 to $19, which with $1.25 freight, three-quarters of 1 per cent. insurance, and a small profit to the dealer ought to make the price here no more than $21; but no dealer quotes less than $22. The trouble is that nearly all the iron now held by Boston dealers has been carried for many months, entailing considerable storage, interest and insurance expenses. It is probable that a cash buyer could get No. 1 at $21.50. We quote: No. 2, $20 to $20.50, and Gray Forge, $19.50 to $20. *Bar* continues unchanged, quoting $43 to $45 for Refined, and $35 to $36 for Common. Nails are in light demand at unchanged prices. Sheet is selling at 3c. to 3¼c. per pound. Russia is quiet at 12c., currency. We quote: English Spring Steel, 7c. to 8c., gold; 9c. to 11c. for German; 9c. to 11c. for Machinery; 14c. to 16c. for Cast; 10c. to 12c. for Blister; 8c. for American Spring; 13½c. to 14c. for Cast; 9c. for Blister, and 8c. for Machinery. *Copper* is firmer. For Manufacturers we quote: New Sheathing, 28c.; Bolts and Braziers, 30c.; Yellow Metal

Bolts, 25c. to 25½c.; do. Sheathing, 20c. *Lead* continues weak and demoralized, with no demand whatever from any source, and we again reduce our quotations on Pig. We quote: Pig 5c., to 5⅛c. currency. For Domestic Sheet, 8c.; Pipe, 7½c.; Tin-Lined Pipe, 15c.; Bar Lead, 7c.; all of these, excepting Pig, are subject to the usual trade or 10 per cent. discount. *Antimony* is quiet at 11¾c. to 12¼c., gold, for Boston spot lots, and *Spelter* is easy, closing at $6 on the spot for 10-ton lots. *Tin* has been decidedly firmer during the past few days, after having previously sold down as low as 15c. Stocks are ample, but there is now very little to arrive for two or three months, and at present prices none of the excessive stock of 10,000 tons now held in England can come here. We quote Straits, 15½c. to 15¾c.; Banca, 18c. to 18½c.; Refined English, 15c. to 15¾c., gold. We quote Plates: Charcoal, I. C., $7 to $7.25; Coke, $6 to $6.25, and Terne at $6.50 to $7, gold.—*Commercial Bulletin.*

CINCINNATI.

Messrs. L. R. HULL & Co., under date of Sept. 15, write us as follows: PIG IRON.—The demand is good and well sustained, and there is every prospect of a good fall trade. No scarcity of Iron is felt, however, and prices for all grades continue unchanged.

HOT-BLAST FOUNDRY.

Hanging Rock No. 1, Charcoal	₽ ton.	$23.00 @ 24.00	—4 mos.
Hanging Rock No. 2, Charcoal		22.00 @	—4 mos.
" No. 1 Coke		23.00 @ 24.00	—4 mos.
" No. 2 "		22.00 @ 22.50	—4 mos.
" No. 1, Stonecoal		21.00 @ 22.00	—4 mos.
Virginia, No. 1 Coke		24.00 @ ...	—4 mos.
" No. 2 "		22.50 @	—4 mos.
Ala. and Tenn., No. 1 Charc'l.		22.50 @ 23.00	—4 mos.
" No. 2 "		21.50 @	—4 mos.
Red-short, No. 1 Coke		.... @	—4 mos.
Shawnee No. 1		22.00 @	—4 mos.
Alice No. 1 ex		24.00 @	—4 mos.
Alice No. 1		23.00 @	—4 mos.

FORGE IRONS.

Hanging Rock No. 1 Charcoal	₽ ton.	$21.00 @	—4 mos.
Hanging Rock No 1 Coke		20.00 @ 21.00	—4 mos.
Virginia, No. 1		19.00 @ 20.00	—4 mos.
Ala. and Tenn. No. 1 Charc'l.		19.00 @ 20.00	—4 mos.
Red-short, No. 1 Coke		21.00 @ 22.00	—4 mos.
Cold-short, No. 1 Stonecoal		18.00 @ 19.00	—4 mos.

CAR WHEEL AND MALLEABLE.

Hanging Rock	₽ ton.	$35.00 @	—4 mos.
Southern and Western Brands.		25.00 @ 30.00	—4 mos.

ORE.

Lake Superior		8.50 @	—cash.
Virginia Hematite (Washed)		4.25 @	—cash.

LOUISVILLE.

Messrs. GEO. H. HULL & Co., under date of Sept. 17, write us as follows: Business with the rolling mill and foundries has been very active this month, and the demand for Pig metal still continues good. Our prices of last week remain unchanged. The usual time, 4 months, etc.

FOUNDRY IRONS.

No. 1 Hanging Rock, Charcoal	$23.00 @	24.00
No. 2 " "	20.00 @	21.00
No. 1 Southern, Charcoal	20.00 @	21.00
No. 2 " "	19.00 @	20.00
No. 1 Hanging Rock, Stonecoal and Coke	20.00 @	22.00
No. 2 Hanging Rock, Stonecoal and Coke	19.00 @	20.00
No. 1 Southern, Stonecoal and Coke	19.00 @	20.00
No. 2 " "	18.00 @	19.00
"American Scotch"	20.00 @	22.00
Silver Gray	18.00 @	19.00

MILL IRONS.

No. 1 Charcoal, Cold-short and Neut'l.	18.50 @	19.50
No. 1 Stonecoal and Coke, Cold-short and Neutral	18.00 @	18.50
No. 2 Stonecoal and Coke, Cold-short and Neutral	17.50 @	18.00
No. 1 Missouri and Indiana Red-short.	21.00 @	22.00
White and Mottled, Cold-short and Neutral	15.00 @	16.00

CAR WHEEL AND MALLEABLE IRONS.

Hanging Rock, Cold-blast	34.00 @	38.00
Alabama and Georgia, Cold-blast	25.00 @	33.00
Kentucky, Cold-blast	25.00 @	33.00

ST. LOUIS.

Specially reported by Messrs. SPOONER & COLLINS, Iron Commission Merchants, 217 North Third street, St. Louis, under date of Sept. 13: Our market is still active. Prices remain the same and present prospects indicate no change. Our funaces show no indications to reduce prices, and even if they did it would not increase trade. Any reductions to buyers would decrease instead of increase purchases of metal. The idea that "hard pan" has really been reached is very strong, and consequently firmer prices are sure to follow.

	No. 1.	No. 2.	Mill.	White and Mot'ld
Missouri Stone Coal	$22.00	$21.00	$20.00	$19.00
Missouri Charcoal	22.00	21.00	20.00	20.00
Tennessee Charcoal	22.50	21.00	20.00	19.00
Southern Coke, very soft and strong	23.00	21.00	20.00	18.50
Hanging Rock Charcoal	25.00	24.00	23.00	.....
H. R. Charcoal, Cold-short	24.00	23.00	.....	.....
	Extra No. 1.	No. 1.	B. No. 1.	No. 2.
Hanging Rock Coke	25.00	24.50	24.00	22.00
West Virginia, Coke	23.50	23.00	22.00	21.50

COLD-BLAST CHARCOAL—All Numbers.

Hanging Rock	$25.00 @	38.00	—4 mos.
Tennessee	26.00 @	30.00	—4 mos.
Kentucky	26.00 @	30.00	—4 mos.
Missouri	26.00 @	30.00	—4 mos.
Georgia	26.00 @	30.00	—4 mos.
Alabama	26.00 @	30.00	—4 mos.
Assorted Bar Iron	@	$2.00	rates.
No. 1 Railroad	1.00	per hundred	
Machinery Scrap "	.80 @	"	
Heavy Cast " "	.65 @	"	
Light Cast " "	.55 @	"	
Old Rails	19.00 @	22.00	—4 mos.
Old Car Wheels	17.00 @	18.00	—4 mos.

CLEVELAND.

Messrs. C. E. BINGHAM & Co., 130 Water street, under date of Sept. 15, quote Iron market as follows, 4 mos. time:

FOUNDRY IRON.

No. 1 L. S. Charcoal	$25.00—	4 m.
No. 2 " "	25.00—	4 m.
No. 1 Anthracite	23.00—	4 m.
No. 2 "	21.00—	4 m.
No. 1 Bituminous	23.00—	4 m.
No. 2 "	21.00—	4 m.
No. 1 C. V. Am. Scotch	23.00—	4 m.
B—1 " "	22.00—	4 m.
No. 2 " "	20.00—	4 m.
No. 1 Massillon	23.00—	4 m.
B—1 "	22.00—	4 m.
No. 2 "	20.00—	4 m.

CAR WHEEL AND MALLEABLE IRON.

No. 3 L. S. Charcoal	$26.00—	4 m.
No. 4 " "	26.00—	4 m.
No. 5 & 6 L. S. Charcoal	27.00—	4 m.

BESSEMER IRON.

No. 1 & 2 L. S. Charcoal	25.00—	4 m.

FORGE IRON.

No. 1 Gray	19.00—	4 m.
White and Mottled	18.00—	4 m.

CHATTANOOGA.

Specially reported by S. E. Lowe, Dealer in Metals, under date of Sept. 17: There is nothing new to note in Iron. Movements are regular, with sales of about 700 tons. There is an active demand for Bar Iron and Nails. Prices remain unchanged.

COKE.

No. 1 Foundry, extra	$20.00 @ 21.00
No. 1 Foundry	19.00 @ 20.00
No. 2 Foundry	17.00 @ 18.00
Gray Forge	15.00 @ 16.00
White and Mottled	14.00 @ 15.00

HOT-BLAST CHARCOAL.

No. 1 Foundry, extra	$19.50 @ 20.50
No. 1 Foundry	19.00 @ 20.00
No. 2 Foundry	17.00 @ 18.00
Gray Forge	16.00 @ 17.00
White and Mottled	15.00 @ ....

COLD-BLAST CHARCOAL.

Car Wheel Metal	$22.50 @ 27.50
" extra	24.50 @ 29.50
Forge Metal	17.50 @ 22.50
Muck Bar	29.00 @ 34.00
Old Car Wheels	17.00 @ ....
Old Rails per ton	16.00 @ 17.00
Brown Hematite Ore 50 to 56 per cent. per ton	1.75 @ 2.25
Red Fossiliferous Ore, 50 to 56 per cent. per ton	1.50 @ 1.75

Nails	2½c.	Bar Iron	2c.
R. R. Spikes	2½ "	Track Bolts	3c.
Light Rails	2¼c.	Trestle Bolts	4c.
Ingot Copper	19c.		

BALTIMORE.

Messrs. WYETH & BROTHER, Iron and Steel Merchants, 46 and 48 South Charles street, report us the following prices, under date of Sept. 17: The improvement in trade noticed in our last report, has continued to develop itself and is now becoming quite general. Prices continue to rule firm at quotation figures.

AMERICAN REFINED BAR IRONS.

1 to 6 wide by ¾ to 1 thick	1.95 to 2c. ₽ ℔
1 to 4½ wide by 1⅛ to 2 thick	
Round and Square, ordinary sizes from ¾ to 2 inclusive	1.95 to 2c. "
Hoop iron, 1¼ wide and upward	3 to 3¼c. "
Band Iron, from 1½ to 4 in. wide	2¼ to 3c. "
Horseshoe Iron ¾ to 1 wide by ⅜ to ⅝ thick	3¾ to 3½c. "
Norway Nail Rods	5½ to 6c. "
Black Diamond Cast Steel, Flats, Squares and Octagon, ordinary sizes	14½ to 15c. "
Machinery Steel	8c. to 9c. "
Cast Spring Steel	7½ to 8c. "
Homogeneous Steel Plate	8½ to 9c. "
Perkins' Horseshoes, per keg of 100 lbs	$4.02½
" Muleshoes	5.02½
R. R. Spikes	2¼c. to 2½c.

Common Horse Nails, from 14c. to 18c. per pound

	10	9	8	7	6	
Putnam Horse Nails	23	24	25	26	28c.	per ℔
Globe Horse Nails	23	24	25	26	28c.	per ℔

Messrs. R. C. HOFFMAN & Co., Iron and Commission Merchants, No. 23 South Frederick street, report the Pig Iron market as follows, under date of Sept. 17: The Iron market remains quiet, with moderate demand at about quotations, as follows:

Baltimore Charcoal	$29.00 @	31.00
Virginia	28.00 @	31.00
Anthracite No. 1	19.00 @	20.00
" No. 2	18.00 @	19.00
" No. 3	17.00 @	18.00
White and Mottled	15.00 @	16.00

RICHMOND.

Mr. ASA SNYDER, Iron Merchant and Furnace Agent, Richmond, Va., writes as follows under date of Sept. 17: Wheel Irons are in better demand and firm at quotations. Foundry grades are not so active as during the past three weeks. We quote as follows:

Va. Cold-blast Charcoal,	Cold-short	$21.00 @	25.00
Va. "	Neutral	29.00 @	31.00
Anthracite, No. 1 X		20.00 @	21.00
" No. 2 X		19.00 @	20.00
" No. 2		18.00 @	19.00
Coke, No. 1 X (West Virginia)		22.00 @	23.00
" No. 2 X "		21.00 @	22.00

FOREIGN.

FRANCE.

(Moniteur des Interets Materiels).

PARIS, Sept. 2, 1877.—*Metals.*—As the election draw near the demand for the interior begins to fall off. The demand for export to other European countries is not brisk, except so far as war material for the East is concerned. *Copper.*—The market in general is not strengthened, but fine qualities of Copper remain scarce, and are fully sustained. What influences ordinary sorts of Copper more particularly are the unfavorable reports received from Bombay and Madras as regards manufactures of Copper, a fresh decline having been submitted to there; Calcutta, on the other hand, advises a satisfactory business at firm rates. Copper is languishing at Marseilles as well as here. We quote at Paris: Chili Bars, 182.50; Common ditto, 177.50; Ingots and Slabs, 187.50; English Best Selected, 192.50; and pure Corocora Ore, 185. Havre is inactive and unaltered. Marseilles quotes: Red Tokat, 170 francs the 100 kilos.; small Refined Ingots, 175 to 180; Sheathing, 210; Bolts, 215; and Yellow Metal ditto, 205. *Tin.*—The steadily increasing London stock produces an unfavorable effect, inasmuch as it shows that it cannot be kept within reasonable bounds in consequence of the increasing Australian output, which outweighs any decrease of production in the Straits Settlements, consumption not coming up to expectations. The French markets, our own included, have remained paralyzed consequent upon unfavorable statistics, and we quote here: Banca nominally 183.25; Billiton, 174.50; Straits, 175; Australian, 171, and English Refined, 175 francs the 100 kilos. Nothing transpires at Marseilles, where they quote Banca, 185; Straits, 175; Billiton, 175, and English Refined, 185. The auction at Batavia of Billiton came off at a parity of 174 francs at Marseilles. *Lead* has been quiet but steady. We are unchanged here at 50 to 50.75 francs the 100 kilos. for French, Belgian and German. Marseilles is also inactive and quotes as follows: First fusion, 48.50 to 49 francs; second fusion, 47.75; Sheet and Pipe, 53; and Shot, 53. *Spelter.*—In England a slight giving way is again noticeable, while the Continent holds its own. We are dull here at 51 francs the 100 kilos. for Silesian to be delivered at Havre; other good brands here or at Havre, 50.50. *Iron.*—The markets are quiescent, little going on anywhere just now in France. Here we are decidedly heavy. We quote: No. 1 Rolled, 190 to 195 francs; Mixed, 210 to 220; do. Charcoal, 240 to 250. A small business is doing in Sheet Iron, of which the first class commands 210 to 220, and mixed, 230 to 235. In the Haute-Marne but few fresh orders have dropped in. Foundries are less busy than the forges. Some sheet iron commands have, however, been received. Rates have not varied; we call affinage Pig, wood, 110 to 118 francs; do. coke No. 1, 100 to 102; coke rolled, 170 to 175; mixed, 190 to 195, and wood, 205 to 210 per ton. First-class special is worth 180 to 195, and coke Sheet, 190 to 200. Puddled Sheet for building, 250 to 260 for 2 millimeters, and 230 to 240 for 3 millimeters. There is little doing in the Meurthe and Moselle. Messrs. Fortin, Hermann & Co., of Paris, have obtained the furnishing of the Nancy Water Works in the sum of 1,320,000 francs. Messrs. Haldy, Roechling & Co., of Ponta Mousson, have agreed by tender to supply 3600 tons Pig Iron. In the Northern department the forges and foundries are actively engaged, but fresh orders begin to get less frequent. *Coal* is quiet, the Iron districts having laid in a supply, while at the North the beet root refineries buy no more than they did last year; moreover, our mines have to confront Belgian competition. We can hardly expect more than steady rates.

BELGIUM.

(Revue Universelle).

BRUSSELS, Sept. 2, 1877.—*Iron.*—The situation has undergone little change, and there is as yet no sign of a general revival. The prices we named in our last as having been taken for locomotives furnish the best proof of the anxiety of our works to secure some orders. In order to obtain cash they are apparently but too glad to fill orders leaving no profit. Meanwhile the Willebroek Works have done better, and obtained the building of the Settimo-Rivarolo Railroad in Upper Italy, complete, except the rails to be furnished by the Barrow Works in the Cleveland district, in England. These contracts have been made on remunerative terms. There will be required in that portion of Italy, furthermore, five Iron railroad bridges not yet contracted for. There have been imported into Belgium, during the first 7 months, 409,000 tons Iron ore and old Iron, against 414,000 tons in 1876 and 510,800 in 1875. Of Pig Iron there have been imported 112,000 tons, against 123,000 and 86,000. Of Wrought Iron and its manufactures 7000, against 7000 and 9000. The export has been of ore and old Iron, 105,000 tons, against 87,000 and 93,000; of Pig Iron, 6400, against 6300 and 8000, and of sundry articles in the Iron line, 109,200, against 116,100 and 119,600. *Coal.*—Belgian importation of this fuel during the 7 months under review has been 362,300 tons, against 428,300 and 375,300 in 1876 and 1875 respectively; of Coke, 13,800, against 15,000 and 9000. We have exported during the 7 months of 1877 but 1,763,000 tons, against 2,108,000 and 2,279,000 in 1876 and 1875, and of Coke, 316,000, against 336,000 and 412,000. The French Transatlantic Steamship Company has contracted for Coal in the United States most advantageously, and we shall now have to be prepared for a serious competition from that quarter, not to speak of St. Nazaire brick coal, which the same company has also secured on favorable terms. At all events the decline of our Coal export conveys a hint not to be overlooked.

GERMANY.

(Borsenhalle).

HAMBURG, Sept. 1, 1877.—*Metals.*—Business matters in the metal line in Germany are still dragging, both dealers and consumers, though lightly stocked, operating with extreme caution. This holding back has the effect of rendering importers and speculative holders at the ports rather restless, and in order to realize, lower rates have been named by them for the various metals, except Spelter, the latter remaining quite firm. Thus far this readiness to make concessions has led to but little business. *Copper.*—Of Drontheim a lot was sold at auction. We quote the same 80 marks the 50 kilos.; Minnesota, 100; Quincy, 88, and Tough Cake, 75 to 76. The German *Tin* markets are quiet and weak. Berlin quotes Banca 74.75 to 75 marks the 50 kilos., and English 72.75 to 73. Here sales of Banca have been effected at 70.50. The quotation is 71 to 75 for Banca, and for English Refined 77 to 78. *Lead.*—Quiescent and sustained with difficulty. Berlin quotes Tarnowitz, Hartz and Saxonian 20.25 to 20.75 marks the 50 kilos. Nothing has transpired here, and we quote English Pig 22.50 to 23; do. Sheet, 23 to 23.50; German, 22.50 to 23, and Spanish 25. At St. Petersburgh, L. B. is bringing 35 roubles the 164 kilos. *Spelter.*—Our markets are firm; transactions are but limited in extent. At Berlin good qualities Silesian sell at 19.25 to 20 marks the 50 kilos. Breslau reports few sales; but, though quiet, remains stiff. There being no stock here, we are nominal at 20 marks.

HOLLAND.

(Koch & Vlierboom.)

ROTTERDAM, Sept. 4, 1877.—*Tin.*—The market, in response to a slight improvement in England during the early part of the week, evinced more firmness, but has relapsed into quietude since. Banca, auction conditions, sold at 40½, and subsequently receded to 40¼, to be delivered from the September sale at 40½, and Billiton to arrive, after bringing 38½ declined to 38. Stock on warrants in the hands of the Netherland Trading Society, 75,550 slabs Banca and 10,761 Billiton, against 82,708 and 3119 in 1876. Deliveries in August, 18,141 slabs Banca, against 18,300 last year. Total deliveries since Jan. 1, 93,570 slabs Banca and 2010 Billiton, against 81,875 and 100 in 1876. Afloat by sail from Banca, 1100 piculs, against 3400 in 1876. Stock of Billiton in the hands of private importers, 37,316 slabs; August deliveries, 7501 slabs; total since Jan. 1, 68,910 slabs.

EAST INDIES.

(Gilfillan, Wood & Co.)

SINGAPORE, July 28, 1877.—*Tin* recedes very slowly under the unfavorable influence of adverse telegrams from England and America. We have to report a continuance of very restricted supplies, which in ordinary times would have caused advanced prices. To-day's value is $19.15 per picul. *Tonnage* is still plentiful and rates remain at £2 per ton for dead weight. The Annie Reed, for New York, and Game Cock, for Boston, are loading. *Exchange* on Boston is 4/1½ per dollar for 6 months' sight.

(Aitken, Spence & Co.)

COLOMBO (Ceylon), Aug., 3, 1877.—*Plumbago.*—Quiet, but in fair demand. We quote first cost, cleaned, including packages, per ton, and duty: Lump, 290/, free on board, exchange at par, with commission, 336/ per ton; Chip, first cost, 150/, free on board, 189/; Dust, first cost, 95/, free on board, 131/3; Freight to New York, 60/ per ton. There have been shipped from Colombo and Galle to the United States from October 1st to date, 65,252 cwts., against 49,031 last year; to the United Kingdom, 21,848: to Marseilles, 348; and to Australia and India, 110 cwts., together to all countries thus far this season, 87,558 cwts., against 107,180 in 1876; 84,366 in 1875, and 140,935 in 1874. *Shipping.*—The Conisciffe, for New York, has just fitted up; another handy sized vessel is inquired for to follow her. Sailing vessels take Plumbago, for London, at 40/. *Exchange* 1/9⅜.

(Schmidt, Kustermann & Co.)

PENANG, July 23, 1877. *Tin.*—There has been transacted a good business in this metal, the bulk for China, at $18.95 to $19 per picul, but toward the close a decline to $18.75 has to be noted. Sales of the fortnight, 5400 piculs, 4800 of which for China. Stock in bazaar, 5000 piculs.

AUSTRALIA.

(Mining News.)

ADELAIDE, July 12, 1877.—*Copper.*—The Burra Burra Co. is making rapid progress in sinking Morphett's engine shaft; nearly three fathoms have been sunk during the past month, and the shaft is now down 10¼ fathoms below the 85. The open work and dressing are being pushed on with all possible dispatch, and are yielding about the usual quantities of ore. In the old pitches the men are working with a will, and judging from the ore coming up, it looks as though good results would be obtained. The government is calling for tenders for the construction of a railway 200 miles north of Port Augusta. The tenders are to be in by October next. A Chinese firm is about to get 5000 Chinamen from Cooktown to work the tin mines near the boundary of Queensland and New South Wales. There is promise of a very prosperous season, and we shall probably reap the largest harvest ever gathered in South Australia, and the wool clip will be heavy and of good quality. We have had copious rains every month, including the present, since January, and this is altogether without precedent in our meteorological history since the foundation of the colony.

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(From our Regular Correspondent.)

SHEFFIELD, Eng., Sept. 3, 1877.

THE WEATHER

since I last wrote has been a matter which has commanded as much or perhaps greater attention than the war. For some weeks past we have had very heavy rains all over the country, and last week the downfall was so portentous that in the Forest of Dean and South Wales immense direct damage was done. The little town of Bridgend was partly washed away, so to speak, the damage in that neighborhood alone being estimated at about £100,000. In the North, the Midlands and in Ireland—not to mention Scotland—the damage done to the root and grain crops is immense and probably unprecedented. The potato crops are rapidly rotting in the ground, and on thousands of acres will not be worth taking up—a fact which means a loss of £20 to £30 per acre for every acre of land thus unproductive of a return. As I now write the rain comes down heavily and has done so for nearly 24 hours. Thus our harvest prospects are looking very bad, so that we are naturally discouraged from relying upon any improvement of trade from that basis. Still we hope on, and even now believe that

TRADE IS IMPROVING

a little, particularly in some of the hardware branches, and we are not without hope that the drop of 10/ in the prices of Best Staffordshire bars will result in such other reductions as shall enable the middle class iron makers to cut out all foreign competition, and at the same time induce the large colonial and other export buyers to come into the market for parcels of more respectable proportions than have latterly been made up. We are also greatly encouraged by the railway orders just given out on Indian account by the government, especially that for 120,000 tons of rails, and are told to rely upon them as an earnest of a better state of things in the immediate future. It appears certain that in the Sheffield cutlery, plating and other light industries there is more business doing, and that at Birmingham the "season" trades (such as gas fittings, steam pipes, bedsteads, &c.) are now becoming considerably busier than heretofore. In alluding to

THE INDIAN ORDERS

just mentioned, I may here add that the government has resolved to construct 2500 additional miles of railway in the famine districts near Indore and the central provinces. For these further lines over 125,000 tons of rails have been ordered from five leading firms at prices which are about £6. 10/ at the works. The firms to whom these good contracts have been awarded are Steel, Tozer & Hampton, Phœnix Works, near Sheffield; the West Cumberland Iron and Steel Company, the Barrow Company, the Dowlais Company and the Ebbw Vale Company. Besides these, a correspondingly heavy tonnage of iron sleepers has been ordered in Glasgow, and the requisite cast iron chairs from Cleveland firms, who are supplying the latter articles at very little over £3 per ton. The orders for the rolling stock have been given out to a concern near Manchester (Ashbury's, I believe), and to one or two of the Birmingham companies devoted to that class of work. The axles, tyres, &c., for these wagons and also for further locomotives are being made here, one good order being now in hand or only just finished, at the Atlas Works of John Brown & Co. This, so far as is known, represents the government orders and will involve an expenditure of between £2,000,000 and £3,000,000, or may exceed the last figures. But the companies are also bestirring themselves, the Great Indian Peninsular line having ordered 60 additional locomotives and the Indian States line a large number, not precisely stated, but which must be of great proportions, seeing that 36 are being built for this line by the Yorkshire Engine Company, near Sheffield. From these particulars—somewhat hurriedly gathered on your behalf—it will be apparent that such considerable orders are calculated to do several branches of trade a great deal of good and may stimulate some of them to an initiatory activity. The rail manufacturers may properly congratulate themselves, inasmuch as those who are favored in this particular may be considered out of the market for "present or early" deliveries for some five or six months henceforward.

FROM PARLIAMENTARY PAPERS

just issued I gather that the total value of British iron works assessed to the income tax was in 1862 £1,079,59, but in 1875, £7,260,802, although in 1873 the figures stood at £4,762,331 only. The increased value of the mining property of the country is also enormous, the total in 1862 being £4,436,110, whereas by 1875 it reached £14,107,990.

THE TAY BRIDGE

was practically completed on Saturday, when the two last girders were raised into position. Most people will know that this structure, which is the largest in the world of its class, is over two miles long and crosses the Tay estuary on the East Coast of Scotland. There are eighty-five spans in the bridge, thirty of which spans are 90 feet above high water level. The time occupied in the construction has been nearly seven years, the total cost having been £300,000, and the loss of life by accidents about 22 persons.

THE PRINCIPAL FOREIGN TARIFFS

are illustrated by a parliamentary return just made on the motion of Mr. Fawcett, the well-known M. P. and Professor. The *ad valorem* duties on pigs, bars and rails are thus estimated:

	Pig Iron.	Bar Iron.	Iron and Steel Rails.
Russia	17 %	50 %	28 %
Sweden	Free	Free	Free
Norway	Free	Free	Free
Denmark	Free	9 %	9 %
Germany	Free	Free	Free
Holland	Free	Free	Free
Belgium	7 %	5 %	5 %
France	27 %	35 %	35 to 50 %
Portugal	5 %	5 %	5 %
Spain	34 %	60 to 75 %	46 %
Italy	Free	27 to 67 %	7 %
Austria	17 %	35 %	35 %
Turkey	7.20 %	7.20 %	7.20 %
United States	42 %	67 to 100 %	46 to 83 %

LAST YEAR'S FAILURES

are dealt with in tabular form by the Controller in Bankruptcy, whose report, issued last week, shows that the number of cases last year was 17,488—1360 more than in 1875. Liquidations and compositions have increased from 3651 in 1870 to 8273 in 1876, and the adjudications of bankruptcy have decreased in the same period from 1351 to 976. The average cost of administration in bankruptcies closed in 1876 was about 28 per cent. of the assets. The assets of 192 small estates were absorbed by the expenses, on which the law charges amounted to about 60 per cent. The report says that £100,000 would probably have been saved to the creditors if the costs had been properly taxed.

THE RAILWAY SLAUGHTER

of 1876 is briefly set forth by a Board of Trade report recently published. The number killed on all lines was 1245, and injured, 4724. Of these, 139 persons killed and 1883 persons injured, were passengers. Of the remainder, 673 killed and 2600 injured were officers or servants of the railway companies or contractors; and 433 killed and 241 injured were trespassers or suicides, or others who had met with accidents at level-crossings, or from other causes. Of the passengers, according to the returns made to the Board of Trade, 38 were killed and 1207 were injured from causes beyond their own control. The total number of passenger journeys, exclusive of journeys by season-ticket holders, was 538,257,205, or about 31,000,000 more than in the previous year. These figures yield an average of 1 in 3,872,570, killed, and 1 in 285,867, injured.

THE FAILURES

of last week were few, the chief being those of Elias Gaskell, cotton spinner of Chapel-en-le-Firth for £60,000; William J. Dunford of Dewesbury, for £12,000 and of Joseph Healy Woolen manufacturer, Batley, for about £20,000.

THE LABOR MARKET

is still unsettled and in many districts further strikes are impending. In the Bolton (Lancashire) cotton spinning neighborhood, nearly 12,000 operatives have struck against an attempted reduction of five per cent. They are supported by their "Society." The dispute stops 100 mills owned by 80 firms. At the Bearpark Colliery, near Durham, where the men have been on strike for some time, the owners have evicted 22 miners' families, comprising 105 persons, from houses belonging to them. In Dundee an attempt is being made to impose 56 working hours weekly upon the engineers, who at present work 51 only. The men, numbering about 1000, have all given notice to leave, and will on no account agree to such a course. The Fife & Clackmannan strike continues, as also does the building trade dispute at Manchester. In the latter instance we hear of further engagements of American carpenters. In South Yorkshire and North Derbyshire, the miners' wages question is not yet settled, but there seems to be every reason for apprehending a strike. There was a conference between the two sides on Friday, but the men's representatives could not or would not accept any reduction, and they dare not agree to arbitration until after a council meeting of the association which is being held at Barnsley to day. If a strike should result, fully 30,000 miners would be affected. In various other trades there are inducements in progress for re-arranging wages.

AMONG THE EXPLOSIONS

recorded last week, the principal was that which took place on Friday at the East Cannock Colliery Hednesford, by which three persons were killed and a number injured. This occurrence originated in the accumulation and subsequent blow-up of fire-damp in one of the workings. From Cardiff we hear of an explosion on board the new ironclad ship Iris, while waiting to commence her trial trip, caused by the ignition of coal gas in the bunkers of the vessel. Two of the stokers were very badly burned. At Pontefract a maid servant sapiently and successfully searched with a lighted candle for an escape of gas in the consulting room of her master, a surgeon, and did straightway and with malice aforethought then and there provide her employer with a splendid case of burning and maiming.

SCOTCH PIG IRON

has ruled quiet all round, and prices have had a tendency to weakness. Shipments are on a smaller scale than for same period of last year, and an increase of 1380 tons has gone into stock in the week, making the aggregate now held by Messrs. Connal 157,222 tons, or 76,000 tons over the total of this date last year. It is quite evident that the production is still excessive, although the matter is somewhat complicated by the importation into Scotland of 1540 tons of Cleveland pig. There is no alteration in freights or in ballast pig, which is still 45/. Writing on July 28, from Glasgow, Messrs. William Colvin & Co. said:

The warrant market was quiet and steady toward the close of last week, the price varying from 55/3 to 55/1½. On Monday there was rather a downward tendency, business being done from 55/ to 54/10. To-day there has been more pressure to sell, and a large amount of business has been done from 54/9 to 54/6, closing with buyers at 54/6, one month open, and sellers for prompt cash. The demand for makers' iron is dull and prices are slightly easier.

On August 31, Messrs. James Watson & Co., Glasgow, said: The iron market has been very quiet this week, and the price has declined from 55/ to 54/3½ per ton, closing a shade firmer at 54/5 per ton, cash. Shipments last week were 8480 tons, against 10,550 tons in the corresponding week of 1876. We quote as under:

	No. 1.	No. 3.
G. M. B., at Glasgow	56/	52/6
Gartsherrie, "	63/	55/6
Coltness, "	67/6	55/6
Summerlee, "	60/	54/6
Langloan, "	64/	55/
Carnbroe, "	57/6	53/6
Calder, at Port Dundas	61/6	53/6
Glengarnock, at Ardrossan	60/6	54/6
Eglinton, "	56/3	53/
Dalmellington, "	56/	53/
Shotts, at Leith	61/6	56/
Kinneil, at Bo'ness	56/6	52/6

The prices current of John E. Swan & Bros. (Limited), Glasgow, August 31, include the following:

Gartsherrie, No. 1	62/
Coltness, "	67/
Glengarnock, "	60/
Eglinton, "	56/

There are now 87 Scotch furnaces in blast, against 115 last year.

THE INSTITUTE OF NAVAL ARCHITECTS

has been in session at Glasgow for some days, Lord Hampton presiding. The principal papers read were by Mr. Scott Russell, on "The Boilers and Engines of our Future

Fleet;" by Mr. Kirk, Glasgow, on "The Effect of Punching Iron and Steel Plates;" by Mr. C. H. Haswell, of New York, "On Marine Boilers—their Design, Construction, Operation and Wear;" by Mr. J. Melton, Surveyor to Lloyd's Register, "On the Strength of Boilers," and by Mr. Ravenhill, on "Twenty Minutes with our Commercial Steam Fleet in 1877." All the papers are published in *The Engineer* and other journals.

TRADES OF SHEFFIELD.

The principal theme of conversation just now in business circles is the action of the local coalowners, and the probability of its success or failure. The decision to give notice of a general reduction of the miners' wages was arrived at last week, at a well-attended meeting of the South Yorkshire and North Derbyshire Coalowners' Association (Limited), over which Mr. Robert Baxter presided. The reasons put forward for the proposal are the growing depression of trade and the present low selling prices, which are said to be out of proportion to the wages paid. If the masters persevere with their notices, I am informed the miners will of a certainty resist to the bitter end, on the ground that their wages are already down to nearly starvation limits, and that the pits are so overstocked with men that no matter how willing a collier may be, he cannot earn other than very moderate wages. On the other hand, the owners are now enabled to quote the precedent of the Staffordshire men's acceptance of a reduction, and to point out that that drop now renders it all the more necessary for them to persevere. What the issue may be is not known n time for this letter, but it will be of much mportance, as over 30,000 men are or will be affected thereby. The iron and steel manufacturers, and others whose consumption of fuel is heavy, are awaiting the result with some anxiety, seeing that many of them, dull as times are, could not bear a stoppage of coal supplies without disaster, while, on the other hand, they would count upon a reduction in price as a natural outcome of any drop in wages.

In the iron trade the week has brought no particular change, save that in several respects the pig iron market is not, and is not likely to be, as strong as it was a short time ago. With heavy stocks accumulating all over the kingdom, and no improvement in the call for finished iron, it is not possible to predicate any stiffening of pig prices just now. In the Leeds district, however, a demand for special brands has sprung up, in consequence of which it is stated that the Aireside Hematite Iron Company are about to blow in two of their large furnaces at Hunslet. From other parts of the district matters are reported dull by all the smelters.

For merchant iron there is literally no inquiry whatever, the business being done at purely nominal prices and only in respect of what are decidedly odd lots. Nail rods, a few lots of common bars, rounds and sheets comprise the sorts of common iron most in request, and in better sorts of edge-tool iron, bars for engineering purposes, good hoop iron and boiler plates only are meeting with any call, and that not a large one. In the Bessemer trade there is a moderate amount of business in hand at several of the leading establishments, that class of steel being in most request for forgings and in various rolled forms. There is a pretty good sale for Bessemer steel sheets and rods, a good deal of this material being now made use of by file, tool and other manufacturers instead of the cast steel, which was formerly exclusively worked up. Bessemer rail ends are extensively bought by wire drawers for rolling down and by cutlery manufacturers for cheap knives. In this connection I may state that I learn there is just now a capital demand for wire, both Bessemer and cast steel, for bridge building, telegraphic and colliery winding purposes. The lightness of steel relatively to iron causes it to be more and more in vogue for those appliances in which weight is of great moment. At the Dronfield Bessemer Steel Works the rail mill men have received notices of a reduction of 10 per cent. at the expiration of 14 days from Saturday last.

On Tuesday an attempt was made at Sheffield to sell the Charlton Iron Works, Sheffield, by auction, but there was no bidding when put up either in one or two lots. The works occupy an area of nearly seven acres, and comprise a blast furnace 52 feet high and another blast furnace 70 feet high, foundry, forges, rolling mills, 43 puddling furnaces, &c.

There is an upward movement in cutlery. Last week, I am told, Joseph Rodgers & Sons were "on full time," and several merchants exporting to the States assure me that there is a stronger demand thence.

THE "SHAW" KNIFE

dispute between George Wostenholme & Sons (Limited) and their workmen, once more turned up in the Sheffield County Court last week, or rather it turned up trebly, for there were three cases for the judge's decision. The plaintiffs were cutlers named John Hensworth, William Winnell and William Wellwell, and their claims were precisely the same as on a former occasion by the last named, viz., that 9 6 a dozen was not a sufficient price for making the Shaw knife. The manager had told them they must either make it at that or go. The men refused, and as they had contracts sued for full wages. In these cases the judge has reserved his decision.

BIRMINGHAM AND STAFFORDSHIRE.

On the Birmingham 'change last Thursday there was a disposition to do more business, probably in consequence of the reduction of 2/ per ton in coal and the resulting disposition of the ironmasters to accept lower quotations. More orders for finished iron were booked than for some time past as soon as it became known that some of the leading producers had decided to reduce the list by 10/ per ton, making best bars £8. 10/. The "marked iron" firms met in private on the same day, under the chairmanship of Mr. Fisher Smith (Earl Dudley's agent), Messrs. Barrows and other houses being represented. The result of the "caucus" was as indicated, and was announced by circulars to customers on Saturday. The week's mails from the colonies have been of moderate degree, the New Zealand and Australian letters bringing fairly good indents for galvanizing and other sheets, fencing iron and general hardwares, prominently those for domestic uses and for the cultivation of the rough bush lands of the interior. The hardware industries are rather better engaged. A local paper says: "Button makers are not busily engaged in any branch, and the season demand as regards ladies' buttons is finished. The pearl branch is considerably better, and the demand for shirt pearls has increased during the last few weeks. The jewelry trade is in the same depressed state as formerly reported, and until considerably after a revival takes place in commercial affairs generally, no improvement can be expected. One or two of the leading houses are busy on special orders, such as mayors' chains, silverware, &c. The fancy pencil trade is extremely quiet. The general brass foundry trade is fairly well off for orders, and inquiries for stair rods, cornice poles, &c., required for house furnishing are much more frequent. The tube and metal trades are quiet. The brass wire trade is, however, a little more active, which is possibly due in some measure to the absence from special causes of the late severe competition which had existed for some time past in this business. The chandelier trade is quiet, considering that the season orders should now be fairly to hand, but the ecclesiastical branch is better, some good orders having lately been received by our local firms," Many hardwares are rather cheaper.

THE NEW SPANISH TARIFF.

The following table, compiled for Earl Derby by the secretary of the Birmingham Chamber of Commerce, shows the difference between the duties which will have to be paid by "favored" (2d column) and "unfavored" (1st column) nations. The United States belong to the latter:

	Francs per 100 kilos.	Francs per 100 kilos.
Iron, in pigs	2.50	2.31
Iron tubes, in cast iron	4.70	4.12
Cast iron, in manufactured goods, such as hardware, hollow-ware	17.50	13.75
Railway bars (iron and steel)	8.00	7.50
Sheet iron	9.00	8.10
Bars and thin sheet iron	13.00	10.50
Iron wire	8.00	7.20
Iron nails and screws	20.00	10.00
Iron tubes (drawn)	13.00	18.00
Iron, in finer manufactures	27.50	25.50
Copper, in bars and ingots	22.50	19.00
Copper and brass, in sheets and nails	50.00	44.80
Copper wire	50.00	44.80
Brass tubes	70.00	52.00
Brass wire	30.00	26.00
All other metal goods not previously enumerated, being manufactured	37.50	16.50
Buttons of all kinds, not being of the prec. met. (per kilo)	2.00	1.00
Cartridge cases	75.00	30.00
Cartridges (loaded)	60.00	25.00
Percussion caps	175.00	160.00

SOUTH WALES AND MONMOUTHSHIRE.

Last week's coal exports from these ports were 120,000 tons, and the iron exports rather under 4000 tons. There is no particular change of importance to note in any branch of the iron or steel trade. The Scotch firm which has acquired an interest to the extent of £500,000 in the Plymouth Iron Works is said to be that of Morton & Co. The tin plate works are moderately employed, mostly on French, American and home orders. Prices are not very firm, but are moderately steady.

THE METAL MARKETS

have been as quiet as before, with no great amount of business doing. The official closing reports of the London Metal Exchange for Friday (and consequently to-day's opening prices) are as follows: *Copper* steady. In Chili bars only a small business. Lota at £67. 15/, and picked brands at £68. 15/; G. O. B. quoted £67. 10/ to £67. 15/; Australian firm for spot parcels; Wallaroo, £80 to £81; Burra, £75; English tough, £73 to £74; select, £75 to £76; sheets, £79 to £80. *Tin.*—Small business in Straits at £65 and Australian at £63. 10/ to £63. 15/; English ingots, £68. 10/ to £70. Scotch *Pig Iron*, 54/4½, cash. *Lead* more inquiry steady; English pig, £19. 17/6 to £20. 5/; soft Spanish, without silver, £19. 15/. *Spelter*, £19. 2/6 to £19. 7/6 for ordinary brands. *Antimony*, £48. Tin quiet; Straits, £65; Australian, £63. 10/.

Messrs. Von Dadelszen & North say: *Copper* continues dull and prices lower. Chili bars have been sold at from £68 to £67. 10/, cash, for G. O. B., and £68 to £69 for named brands. Very little doing in Australian; spot Wallaroo quoted £80 to £80. 10/. Fifty tons for delivery in three months said to have been sold at £78. Burra, spot, £75, and three months, £74. English easier; tough, £73 to £74; select, £74. 10/ to £75. 10/; sheets. £79 to £80. *Tin.*—There was a little spurt early in the week, and £66 was paid for Straits and £64. 10/ for Australian. The market again declined to £65 for Straits and £63. 10/ for Australian, but closed rather firmer; £65. 10/ asked for Straits and £63. 15/ to £64 for Australian. The Dutch market is flat, quotations being 40fl. for Banca and 38fl. for Billiton. English, £68 to £69 for ingot and £69 to £70 for bars. *Tin Plates* steady; 18/ to 18/6 asked for coke. *Lead* dull; English pig, £19. 17/6 to £20. 5/; soft Spanish, £19. 15/. *Spelter* quiet; £19 to £19. 10/ for ordinary brands. *Quicksilver.*—The importer of Spanish has advanced his price to £9, but second-hand parcels have been selling under this. *Antimony.*—£48 to £49.

The *Mining Journal* remarks: "The unsatisfactory state of affairs generally, and the critical state of political affairs in particular, continue to exercise a very depressing influence over our markets, and the amount of business transacted for shipment, home consumption and speculation in all is extremely limited; but, considering the gravity of the situation, there is, perhaps, cause for congratulation that our markets on the whole are no worse. Our markets would very soon fall into a hopelessly stagnant condition were it not for the continual oscillations they undergo, and the renewed strength they acquire by each successful vibration."

Messrs. Kelly & Co., London, give the following *staccato* report: "*Copper* dull; Australian leads the market. The Indian famine is affecting copper adversely. *Tin* a degree brisker, but almost without hopefulness. Tin plates rather firmer and somewhat more active. *Lead* firmer; stocks decreased; continental requirements greater. *Spelter* very slow and occasionally easier. *Quicksilver* easier but not brisker, and more violent fluctuations expected."

The latest Liverpool prices are:

Iron, f. o. b. in Liverpool, per ton.

	£ s. d.		£ s. d.
Merchant bar	6 5 0	to	6 10 0
" in Wales	5 15 0	to	6 0 0
Staffordshire	7 0 0	to	9 15 0
Hoop	7 10 0	to	8 10 0
Sheet	8 10 0	to	9 15 0
Nail rod	7 0 0	to	7 10 0
Bar, best crown	7 0 0	to	8 0 0
Boiler plates	9 0 0	to	10 0 0

Tin Plates, f. o. b. in Liverpool, per box.

	£. s. d.		£ s. d.
Charcoal, I. C	1 2 6	to	1 4 0
Coke, I. C	0 18 0	to	1 0 0

Copper, delivered in Liverpool, per ton.

	£ s. d.		£ s. d.
Bolt and sheathing	82 0 0	to	0 0 0
Tile	75 0 0	to	0 0 0
Tough cake	76 0 0	to	0 0 0
Best selected	77 0 0	to	0 0 0

New Works of the Jacobus & Nimick Mfg. Company.

The new works of the above-named corporation, to replace the establishment recently destroyed by fire, are now under way, the contract being let some weeks ago. The factory will be located at Idlewild station, seven miles from Pittsburgh and about one mile from Mansfield. The main building, for the manufacture of locks, scales, coffee mills and miscellaneous hardware, is to be 320x40 feet, somewhat in the form of the letter E, with the engine house slightly detached representing the central arm. The iron foundry will be 175x40 feet and the brass foundry 70 feet square. A large fireproof vault for the safety of patterns, 40 feet square, will also be provided. The engine room will be furnished with a 100 horse-power engine with three boilers. The japanning room will be 40x50 feet. The machinery, we are informed, will all be new, and in this particular the latest improvements will be adopted. A department is also to be added for the manufacture of Berlin and Tucker (imitation) bronze goods. It is estimated that the works when completed will be capable of turning out over $500,000 worth of goods annually, and when in full operation will employ five hundred hands. The directors of the P., C. & St. L. Railroad have been liberal in their encouragement to the company to locate at Idlewild station. The railroad company have laid a frog and switch, with a side track 600 feet long, for the convenience of loading and unloading freight. The office and warehouse of the company in Pittsburgh will be connected by telegraph with the works. The time of local trains from the Union Depot to Idlewild station is twenty-eight minutes, and from the city limits or Point Bridge, fifteen minutes. The contractor is J. F. Bruggerman, of Allegheny, who, for the sum of $24,000 is to have the building completed by the first of November next, or forfeit heavily in case of failure. As the company saved their patterns at the time of the fire, they expect to be in a position to fill orders in a few weeks after the completion of the works. It is also their intention to add new lines of goods, among which will be a full line of real bronze hardware.

Arming the Spithead Forts.

After long delay and much consultation by the Heavy Gun Committee, the Spithead forts are now in course of receiving their armaments. The progress of these forts toward completion has been so deliberate that the whole science of gunnery has undergone a revolution in the meantime, and, in order to prevent them being pulverized from a distance, it has become imperative that they should be armed with guns of a superior nature to those which they were originally designed to carry. But while the circumstances have changed, the buildings remain the same, and the great difficulty which the military authorities have had to face has been the contrivance of some means of working the modern heavy ordnance in embrasures and casemates considerably too small for it. The difficulty threatened to be insuperable, as manual gear was out of the question; but, just in the nick of time, Mr. George W. Rendel perfected his hydraulic system of working heavy guns, and it was seen at once that an obedient and uniform power, which could load, run out, and pivot a gun within the cramped space of a turret was exactly what was wanted. The Elswick Company were accordingly, on the failure of the pneumatic appliance, invited to send in plans of their hydraulic gear, and having been accepted and applied, it has been found possible to mount the forts with 38-ton 12½-inch muzzle-loader guns. A preliminary trial was recently made, under the superintendence of Colonel C. W. Younghusband, the superintendent of the Royal Gun Factory and president of the Heavy Gun Committee, and Messrs. George and Stuart Rendel, of one of the two hydraulic carriages with which the Norman Fort has been provided. The 38-ton gun was loaded, and worked entirely by means of the hydraulic gear, and the mechanism was found to answer admirably. Four rounds were fired altogether, one with 80 lb. of powder, another with 110 lb., and two with 130 lb., which is the full battering charge of the gun. The shot in each case weighed 800 lb. After the trials the inventor made some adjustments of the machinery. It having, in consequence of the confined space within the casemates, been found difficult to load the gun from the front, it is by Mr. Rendel's system turned completely round and loaded from the rear, where there is ample room, and the men are thoroughly sheltered from splinters or bullets. These advantages are gained without any sacrifice of time, for the monster gun was turned to the loading position and back in a few seconds, and it is confidently expected that it can be fired at about the rate of 1½ minute per round. The application of the hydraulic system within the Spithead forts will secure an important economy in men, and thus prove a great relief to the garrison artillery.

The system of glazing used on the roof of the Royal Aquarium, London, consists of a series of zinc bars of pot-hook section, with a return bend, the bars being screwed on the purlins. The top is simply a pot-hook or hanger section, and the bottom one of the same section reversed. The glass rests in the groove of the lower bars, and back groove of the intermediate and upper one, in which it has full vertical play. The panes of glass lap each other, and the theory is that no water can find its way inside the building covered by a roof glazed on this principle. The advantages of this system appear to be diminution of breakage of glass from vibration, and expansion and contraction, and other causes due to rigid fixing in the ordinary system, and the facility with which glass can be fixed or a damaged pane removed and replaced. The grooves carrying off water from the inside as well as from the outside is of course another advantage, for unless the roof be at a very flat angle indeed, water will not leave the glass but will run down into the outside groove. Condensed water and vapors are therefore thus well got rid of. This seems to be very much like a plan which has been in successful use in this country.

The United States is doing more toward feeding Europeans this year than during corresponding periods of last year, as will appear from the returns of shipments of fresh beef, butter and cheese. Last year, 19,990,895 pounds of beef, valued at $1,755,191, were exported; and from January 1 to August 25 of this year 69,864,490 pounds, valued at $6,983,499, were shipped. From May 1 to August 24, 6,871,927 pounds of butter, and 54,278,564 pounds of cheese had been shipped from New York, against 2,126,808 pounds of butter, and 44,042,900 pounds of cheese exported during the corresponding period of last year. The shippers' price of butter is about one cent a pound less than the price obtained last year, but the average price of cheese is 1½ cent higher. Nearly all these shipments were to ports in Great Britain.

The Ohio Steel Barb Fence Company, which has long been located on Wason street, Cleveland, has begun the erection of a new building for manufacturing purposes, on the corner of Case avenue and the Lake Shore and Michigan Southern Railroad. The frontage on the street will be 104 feet, and on the railroad 150 feet. The building will be of brick, have a slate roof, and be two stories in hight. There will be side tracks from the railroad leading directly to the structure. The concern will have a capacity of 30 tons of barb fence per diem. It is anticipated that new machinery will be added and more hands engaged than the 100 at present employed, after November 1, when it is believed the new building will be furnished. —*Review.*

The following shows the total shipment of ore from the Lake Superior district for the season, together with those of a corresponding period last year:

From where.	1876.	1877.
From Marquette	345,641	423,980
From Escanaba	245,099	289,774
From L'Anse	61,952	51,100
Total	652,692	764,854

Showing an increase of 112,163 gross tons—though it is proper to say that one week's shipments from Escanaba, last year, are missing, and not included in the comparative statement. The Republic is 40,000 tons ahead of its competitors, having, up to the 12th inst., forwarded in round numbers 140,000 tons of ore. The Cleveland follows after with something over 100,000 tons, and the Lake Superior stands next with 93,759 tons. It is proper to say, however, that both the latter have shipped considerable ore by rail, south of Escanaba, which is not included in the above figures.—*Mining Journal.*

The Cincinnati *Gazette* says: The following arrivals of pig iron were received here per barges and weighed by W. H. Broadwell, public weigher:

Furnaces.	Tons
Mt. Vernon	356
Mt. Savage	156
Pennsylvania	100
Hunnewell	140
Charlotte	50
Hecla	160
Quinnimont	80
Lawrence	386
Ironton	241
Princess	500
Total	2,150

Two screws, which the London *Engineer* says are probably the largest in existence, are being cut at the Deal square of the Royal gun factories for the new lathes which are required for the manufacture of heavy guns. The screws are each 65 feet in length by 7 inches in diameter, and the machinery employed being in a somewhat restricted space, the wall of the building has been removed to make room for them. The lathes, of which they will form part, will have 72-inch centers, enabling them to turn a gun or any other work 12 feet in thickness.

The Root Hame and Chain Works, at Richmond, Ind., are running full. The business has increased very much during this year. Messrs. Starr & Son, the proprietors, have made three additions to the works this year, and are now making the fourth, which consists of a large building adjoining the old one. When this addition is completed they will employ about 90 hands. They are now putting up 30 additional forges for making chains.

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John Chatillon & Sons, Balances.
L. Coes & Co., Patent Screw Wrenches.
A. Field & Sons, Tacks, Nails, etc.
Goodell Co., Apple, Peach and Potato Parers.
Hubbard, Bakewell & Co., Lippincott Axes and Shovels.
Iowa Farming Tool Co., Handled Hoes and Rakes, Snaths, etc.
Kimball Shovel Co., Solid Cast Steel Shovels and Spades.
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Henry W. Kip, C. S. Hammers.
Lancaster Bolt Co., Eagle Carriage and Tire Bolts.
Lamson & Goodnow Mfg. Co., Table Cutlery, Butcher Knives, etc.
Meriden Britannia Co., Plated Ware and Britannia Spoons.
W. T. & J. Mersereau, Stair Rods, etc.
Wm. McNiece, Saws.
Nicholson File Co.
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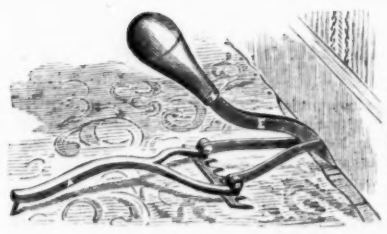

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THE SCROLL SAW.

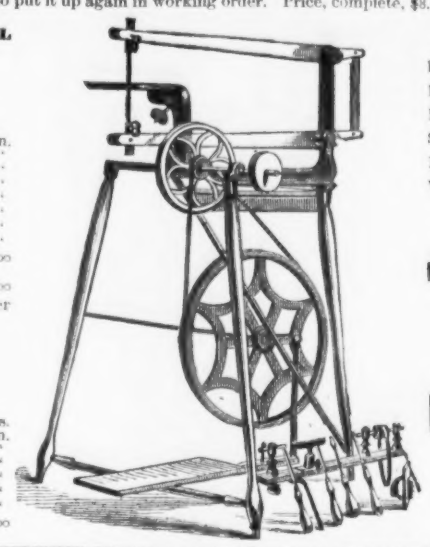
Length of arms	20½ in.
Length of sweep for work	17 "
Height of table above floor	31 "
Diameter of table	6 "
Length of stroke	1½ "
Diameter of driving wheel	12 "
Diameter of balance wheel	6½ "
Diameter of emery wheel	3½ "
Number of strokes of saw per minute	1,000
Number of revolutions of emery wheel per minute	1,000

These speeds are made with a tread of 150 per minute.

Weight of Scroll Saw, 30 lbs.

THE LATHE.

Weight	6¼ lbs.
Length of ways over all	15¾ in.
Distance between centers	9 "
Swing	3 "
Length of slide rest	4½ "
Height of head and tail stocks above ways	2⅝ "
Diameter of cone pulley	1¾ "
Number of revolutions per minute	7,000



THE CIRCULAR SAW.

Diameter of saw	⅛ in
Length of saw arbor	2¼ "
Height from floor to table	33 "
Size of table	4x5⅛ "
Number of revolutions per minute	7,000
Weight	½ lb.

Total Weight of Combination, 36 3-4 lbs.

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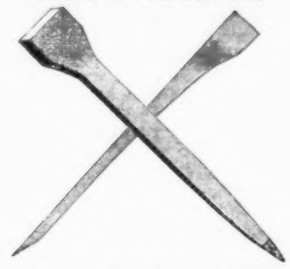

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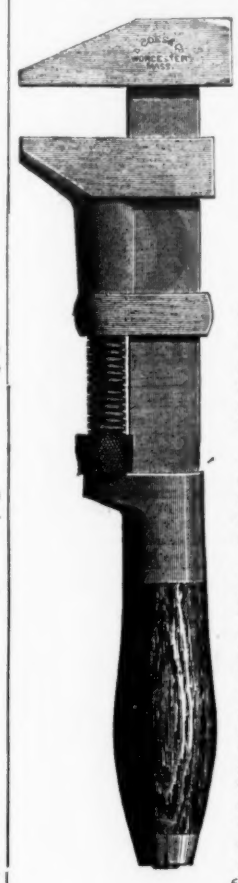

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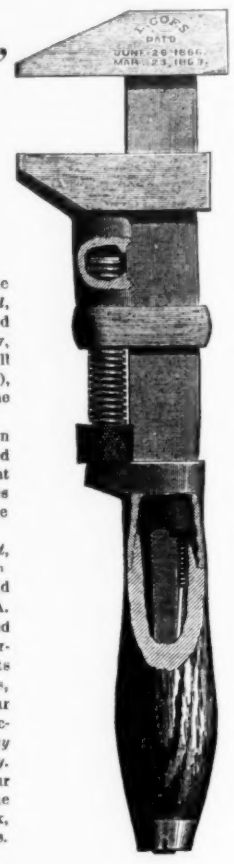

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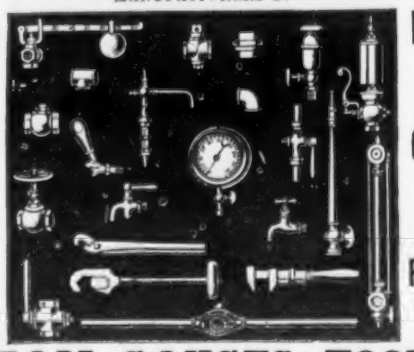

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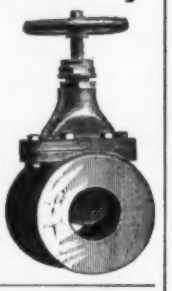

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Address, LEONARD BAILEY & CO., Hartford, Conn.

PUREST BLACK LEAD, Lump and Ground.

McILVAINE BROS.,

15th and Hamilton Streets, PHILADELPHIA.

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No. 231 South Front St., PHILADELPHIA.

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MANUFACTURERS OF

PURE WHITE LEAD, RED LEAD, Litharge, Orange Mineral, Linseed Oil AND PAINTERS' COLORS.

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White Lead, Red Lead and Litharge.

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The Atlantic White Lead and Linseed Oil Company,

MANUFACTURERS OF

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JOHN JEWETT & SONS,

Manufacturers of the well known Brand of

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Also Manufacturers of

LINSEED OIL

182 Front Street, NEW YORK.

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McNab & Harlin Mfg. Co.,

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BRASS COCKS AND VALVES

For STEAM, WATER and GAS.

Iron Pipe and Fittings, Plain and Galvanized.

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New Illustrated Catalogue and Price List sent by express to the Trade on application.

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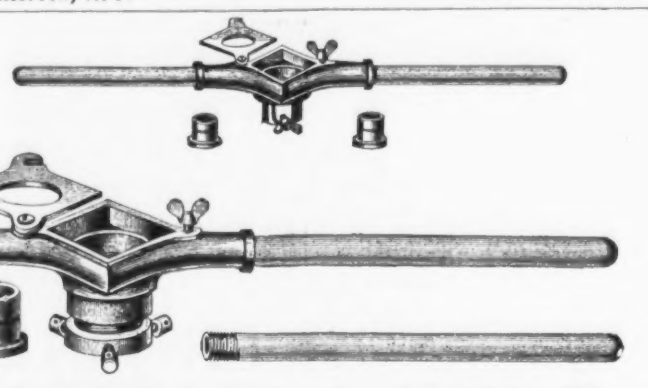

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STOCKS AND DIES FOR GAS PIPE.

The bodies of these stocks are of Malleable Iron, as light as is consistent with strength; the handles of Wrought Iron Pipe; the plates of Bronze metal, finished. Each size Stock is packed in separate box, as also each Die.

GAS PIPE TAPS AND TONGS.

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OAK HILL, N. Y.,

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Newman's Pat. Mincing Machines,
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Wall Safes or Cylinder Rings,
Hay Fork Pulleys,
Grindstone Hangings,
B. D. Hangers and Rail,
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Coat, Harness, Wardrobe and School House Hooks,
And Builders' Hardware generally.

Send for catalogue and price list.

J. S. PROUTY, Prest. A. H. GOSS, Sec'y and Treas.

Prouty Hardware and Manufacturing Co.,

Wholesale dealers in

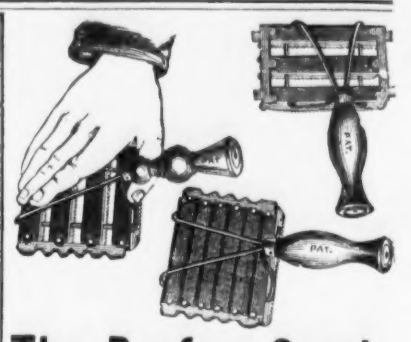
FOREIGN & DOMESTIC HARDWARE, &c., &c.

Agents for Amwake's Scandinavian or Jail Locks.

A large lot of **Birmingham Shovels** at job prices.

Agents for **ERIE LAWN MOWERS.**

No. 53 Beekman Street, New York.



The Perfect Comb.

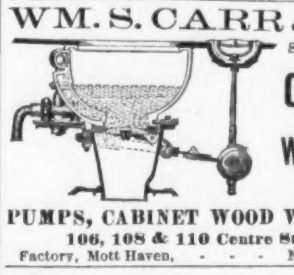
We call your attention specially to our new patent endless wire frame comb. The result of a long series of experiments, made with a view to meeting all the requirements of a *Perfect Comb*. It is better, stronger, and more durable than any ever before invented. The raised wire shank gives what has never before been attained, viz: a rest and brace for the thumb, in such a position that the hand cannot come in contact with the horse while using the comb. The wire braces which run from the shank over the back to the front teeth give strength and durability in a direction never heretofore attained, and at the same time serve as an extra handle; and when grasped by the fingers in connection with the raised shank the comb is more firmly, easily, and completely held, and with much less fatigue to the hand than is possible in any other formation—in short, it needs but a trial to vindicate its name: **The Perfect Comb.**

THE LAWRENCE COMB CO.

Factory and Office,

382 2d Ave., cor. 22d St., N. Y.

WM. S. CARR & CO.



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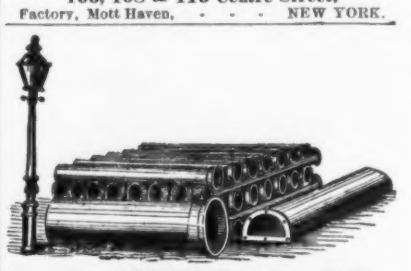

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Cast Iron Pipe

FOR WATER AND GAS.

Lamp Posts, Valves, &c.,

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400 CHESTNUT STREET.

COIL CHAIN.

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We furnish a better article for less money than any concern in the country.

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Railroad Track Scales,

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Patented Furnace Charging Scales,

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Testing Machines of any capacity.

Send for illustrated price list, mailed free. Tests made daily. Reports copied and kept confidential. Special attention devoted to repair work. Skillful Mechanics sent to all parts of the country. All work guaranteed.

The Hubbel Screw Co.,

LIMITED,

Are now prepared to sell, to approved parties, licenses to use the improvements in machinery for making Metal Screws, secured to them by Letters Patent, at the rate of fifteen dollars per month.

They are also prepared to contract for Machine Screws of every description made in solid dies.

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JOHN S. LENG, Treasurer,

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LENG & OGDEN,

212 Pearl Street, New York.

LANSDELL & LENG'S

Patent Lever and Cam Valves.

LANSDELL'S PATENT

Steam Siphon Pumps.

IRON

Of every description, for domestic use and export.

TACKLE BLOCKS

BURR & CO.,

Manufacturers of Waterman and Russel's

Patent Iron Strapped Blocks,

ALSO, MANUFACTURERS OF

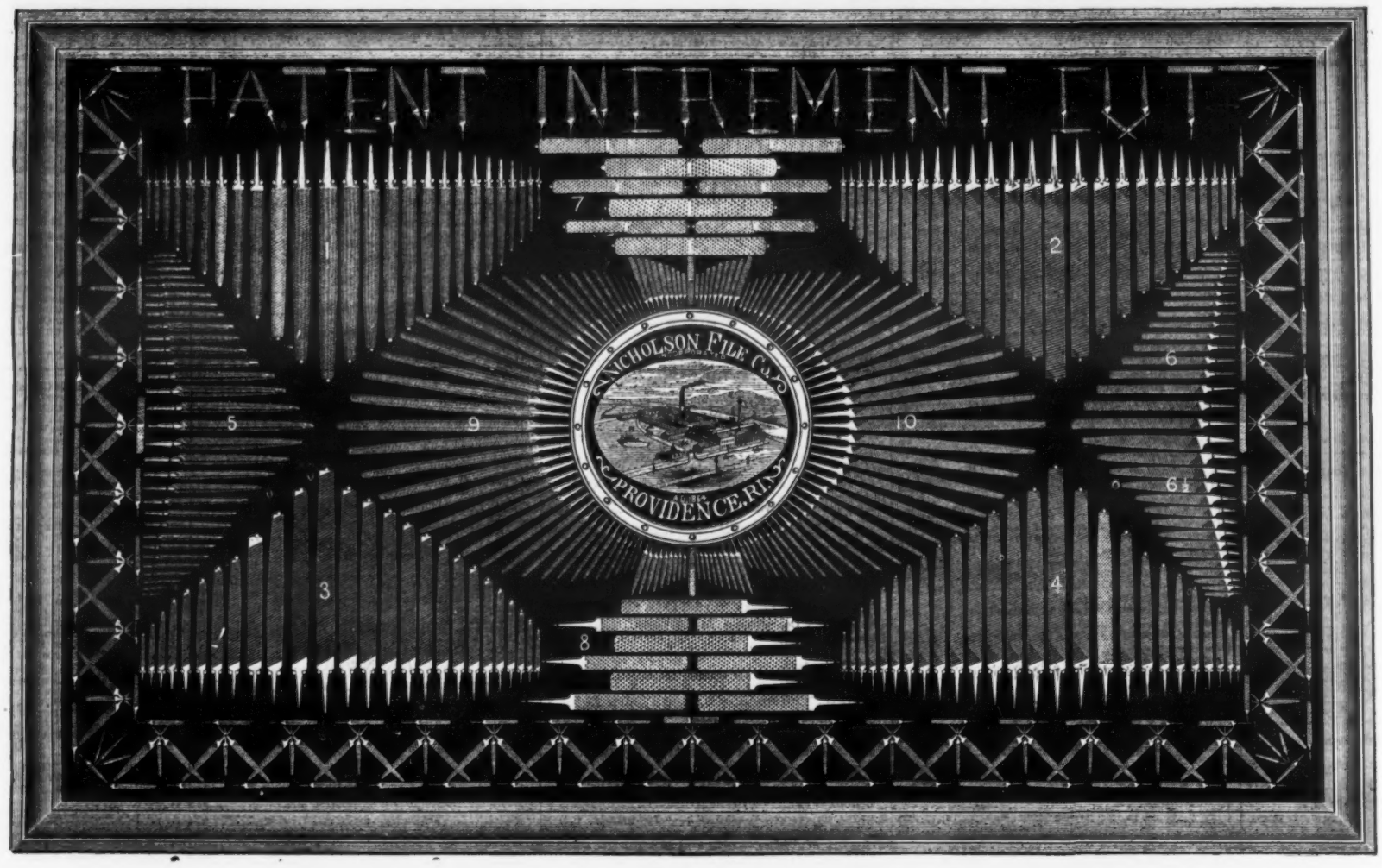
ROPE STRAPPED BLOCKS,

11 PECK SLIP, NEW YORK.

The Iron Age Directory

and Index to Advertisements.

NICHOLSON FILE COMPANY, Providence R. I.



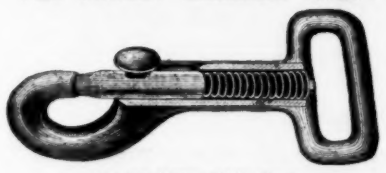
KEY.

1.—Half Round. 2.—Hand. 3.—Mill. 4.—Flat. 5.—Triangular. 6.—Pillar. 6½.—Knife. 7.—Plain Rasps. 8.—Tanged Rasps. 9.—Round. 10.—Square. 11.—Borders.

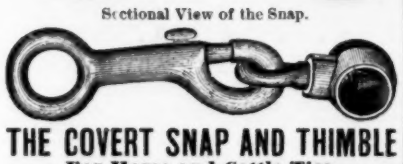
In addition to above we manufacture **FILES AND RASPS** of every description and kind known to the trade. These goods are not excelled, and by a large proportion of both **Consumers** and Dealers are admitted as superior to any either of **Foreign or Domestic Manufacture.** We are constantly improving and adding to our machinery, and by carrying a stock of from 30,000 to 50,000 dozen Files on our shelves at all times, we are enabled to fill orders with the utmost dispatch, thereby saving both loss of **Trade** and **Interest** to our customers.

For several months past we have been engaged upon a **Catalogue** and **Treatise,** illustrative of the **File and its Uses,** which we hope soon to have ready for distribution. In this work we expect to introduce several new and important appliances connected with the uses of the File.

THE COVERT HARNESS SNAP.



Sectional View of the Snap.



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For Horse and Cattle Ties.

If you want the best at reasonable prices, send for illustrated circular and price list of the celebrated Covert Harness Snap, Horse and Cattle Ties, Breast Chains, Halter Chains, Post Chains, Rein Chains, &c.

These goods are sold by all leading jobbers in General and Saddlery Hardware at manufacturers prices. Sample Snap sent free of charge if desired.

Address **COVERT MFG. CO.,**
Sole Manufacturers, **Troy, N. Y.**

CLOTHES WRINGER!

Self-Adjusting Steel Phillips Spring.

T. J. ALEXANDER, Manager,
BOSTON, MASS.

"UNIVERSAL" WRINGER.

With Rowell's Cog Wheels at both ends of each roll. Family Size.—No. 2½, $63; No. 2, $66; Large, No. 1½, $74.

METROPOLITAN WASHING MACHINE CO.,
32 Cortlandt St., New York.

The Silver & Deming FAMILY SAUSAGE STUFFER, Lard, Fruit & Jelly Press.

Powerful, Durable and Convenient.

The Best Article of the kind in the Market.

No. A, capacity	2	quarts,	Japanned	$2.50
" B, "	4	"	"	4.00
" AA, "	2	"	with inside of Cylinder Enameled	4.00
" BB, "	4	"	with inside of Cylinder Enameled	5.50

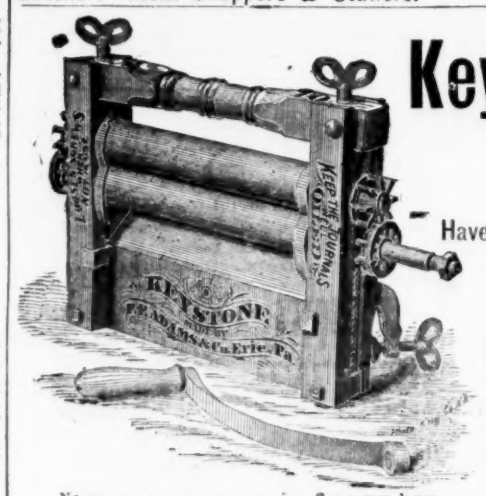
Liberal discount to the trade.

MANUFACTURED BY
SILVER & DEMING MFG. CO.,
SALEM, OHIO.

Also Manufacturers of a full line of
Butchers' Meat Choppers & Stuffers.

Fig.2.

(Tipped back for filling.)



No. 10, - - - - $57.00 per dozen.

THE

Keystone Wringers

Have all the Latest Improvements,

And are made in a variety of styles—Wood Frame, Iron Frame, with Common Gears, Purchase Gears or without Gearing. All have **Long Spiral Steel Springs,** giving them **Double the Capacity of any other Wringer** and **Greater Durability.**

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CHAS. D. & W. S. GRAHAM,
No. 88 Wall Street, New York,
AGENTS.

BRYANT'S "NEW PATENT IMPROVED"

(ORIGINAL REESE PATENT ADJUSTABLE)

Self-Locking Stencil Letters and Figures.

Observe this patented

TRADE MARK.

(Registered 1876. Reissued 1877.)

Assorted sizes for Straight, Circular and Hal Circle Printing. These letters **Change** to form any **Name, Word** or **Sentence, at pleasure.** Millions retailed yearly for Bag Plates, etc., marking Robes, Show-Cards, and a thousand daily uses.

Superior to All Other Stencils.

Also Inks, Brushes and all kinds of Stencils and Stock in large variety, at wholesale. These patent letters have been sustained by the U. S. Courts, in suit, O. G. Bryant vs. S. W. Reese & Co., before Judge Drummond, in Chicago, May 15, 1877. All genuine letters are stamped "Pat. March 3, '74," refuse all others and save suit and costs. These are *the standard goods,* having been four years on sale by me and dealers generally. All Hardware dealers should keep these goods.

O. G. BRYANT, 102 Washington St., Chicago, Ill.

Sole owner of the three original patents in the United States and Canada, and exclusive manufacturer Sold by Hardware Jobbers everywhere. Circulars, samples and price lists with discounts on application

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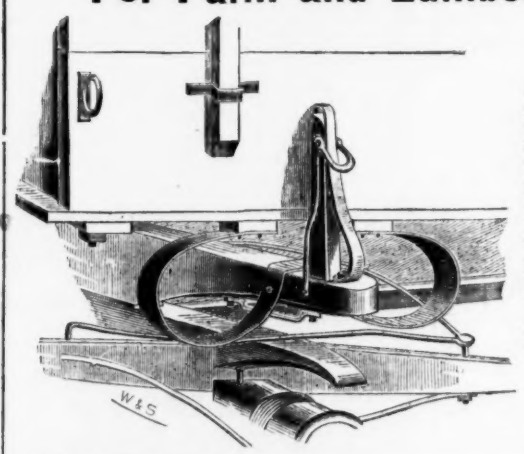
SOMETHING NEW.

BOLSTER SPRINGS

For Farm and Lumber Wagons.

Pulliam's Patent.



Made of the best steel, and warranted. Will fit wagons of any size. Are attached by four bolts through the bottom of the bed. Lift off the gear with the bed. Designed to remain on the wagon for all kinds of work. Operates equally well whether on a loaded or empty wagon. Saves largely in wear and tear. Removes necessity of spring seat. Affords comfortable riding for from one person to a wagon load.

Price, per set of four springs, $6.50. Liberal margin to Wagon Manufacturers and Dealers. Correspondence solicited, and circulars furnished.

Semple & Birge Mfg. Co.
ST. LOUIS.

Parkhurst & Wilkinson,
CHICAGO.

ESTABLISHED 1837.

We are pleased to inform the trade that our facilities for the manufacture of tool chests this season cannot be surpassed. We make two qualities. The first quality is made of heavy American Black Walnut, with partitions and drawers for tools, which are ground, set and sharpened, ready for use. It is especially designed for mechanics and first-class amateurs and for all those in need of extra fine quality of tools. The tools in these chests, manufactured by ourselves, are of our best quality; and those supplied by other manufacturers are warranted their best goods. The second quality is a cheaper article and designed more especially for the jobbing and toy trade. The articles are of good quality and are designed for practical household use. Many years ago, when we were pioneers in this branch of trade, the English on first quality and the Germans on the second quality were formidable competitors and controlled the American market on those goods; but now I am exporting annually large quantities of the best quality to foreign countries, and those goods are scarcely known in this country. Parties engaged in the export trade cannot send a better specimen of American mechanics tools, than by procuring one of our chests, branded Geo. Parr. Consult your interest by sending for illustrated catalogue and revised price list to

GEORGE PARR, Buffalo, N. Y.

Morse Twist Drill and Machine Co.,

NEW BEDFORD, MASS., Sole Manufacturers of

Morse Patent Straight-Lip Increase Twist Drill,

Beach's Patent Self-Centering Chuck, Solid and Shell Reamers.

BIT STOCK DRILLS,

Drills for Coes, Worcester, Hunter and other Hand Drill Presses. Beach's Patent Self-Centering Chucks, Center and Adjustable Drill Chucks, Solid and Shell Reamers. Drill Grinding Machines. Taper Reamers, Milling Cutters and Special tools to order.

All Tools exact to Whitworth Standard Gauges.

GEO. R. STETSON, Supt. EDWARD S. TABER, Treas.

HOBART'S TACKS

MANUFACTURED BY

DUNBAR, HOBART & WHIDDEN,

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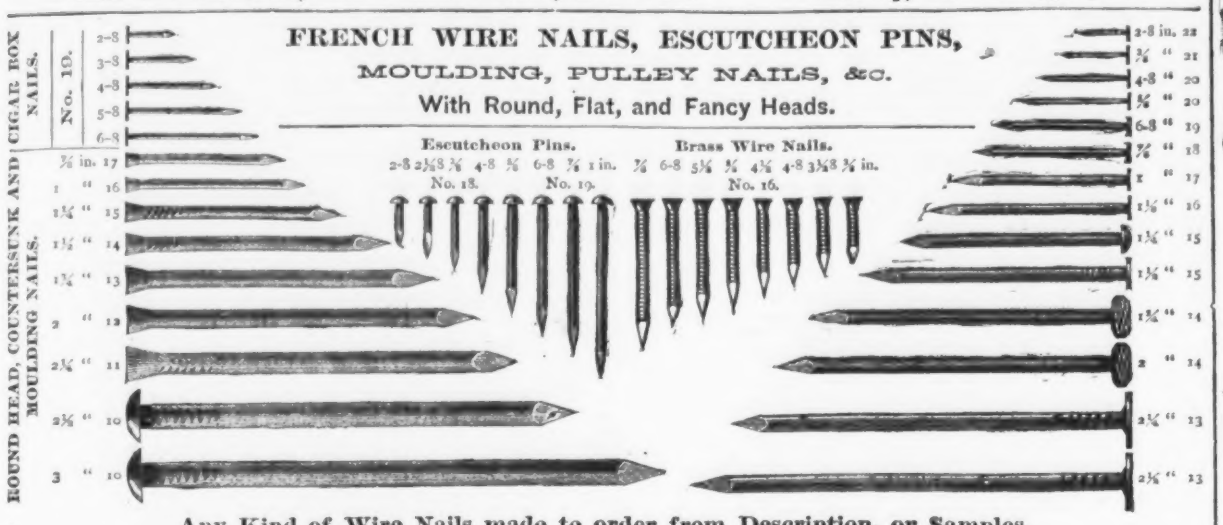
Office and Salesroom, 116 Chambers Street, New York. - - - - Factory, South Abington, Mass.



Any Kind of Wire Nails made to order from Description, or Samples.

American and Swedes Iron Tacks,

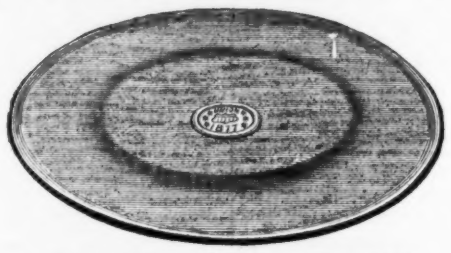
Tinned, Leathered and Large Head Carpet Tacks, Finishing Nails, Black and Tinned Trunk Nails, Miners' Copper, Gimp, Lace and Brush Tacks, Hungarian, Chair, Cigar Box and Barrel Nails, Glaziers' Points,

Iron, Steel, Copper and Zinc Shoe Nails, Patent Improved Brass Shoe Nails,

Heel and Toe Plates, Steel Shanks, and Fancy Head Nails, Silver or Japanned Lining and Saddle Nails,

A full assortment always on hand at salesrooms, for immediate delivery if required. Odd and Irregular Sizes made to order or cut from sample at short notice. **Send for Price List.**

THE UNION STOVE BOARD.



PLAIN AND SHEET IRON LINED.

The cheapest and most durable Stove Board ever offered to the trade. Send for price list, stating quantities wanted.

F. HABERMAN, Manufacturer,

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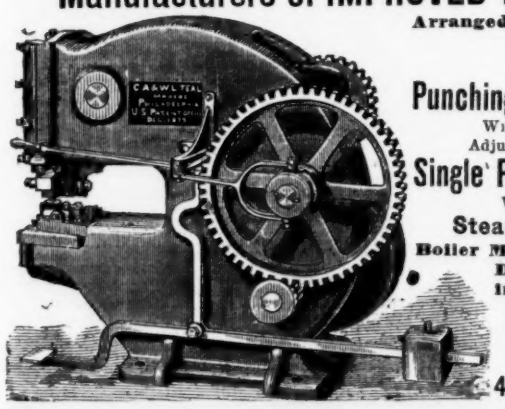
C. A. & W. L. TEAL,

Manufacturers of IMPROVED BENDING ROLLS



Arranged for Removing Work from the end of top roll.

COMBINED

Punching & Shearing Machines,

With "Automatic Stop motion,"

Adjustable to any point of the stroke.

Single Power Punching Machines,

With Shearing Attachments.

Steam Riveting Machines,

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MACHINERY

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CHAMPION BARROWS.

WITH WOOD OR IRON WHEELS.

A first-class article and a specialty, that will make a demand in any market and afford a good margin to dealers. We are prepared to furnish them in large quantities. Manufactured by

BRYAN MANUFACTURING CO., Bryan, O.

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For Sale by THE NEW YORK PLOW CO., General Eastern Agents, 55 Beekman St., New York.

Established 1838.

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Manufacturers of

SLEIGH BELLS.

House, Tea, Hand, Gong Bells, &c.

Bell Metal Kettles.

Lester Oil Co.,

81 MAIDEN LANE, N. Y.

Exclusive manufacturers of the **Renowned**

Synovial Lubricating OILS.

The most Durable, Reliable & Economical Lubricant in existence; Applicable to every grade of machinery. Send for Circular and Price List.

NEWTON & CO.,

Successors to

PALMER, NEWTON & CO.,

ALBANY, N. Y., Manufacturers

FIRE BRICK

Stove Linings,

Range and Heater Linings

Cylinder Brick, &c., &c,

Watson Fire Brick Manufactory

ESTABLISHED 1836.

JOHN R. WATSON, Perth Amboy, New Jersey.

Manufacturer of

FIRE BRICK,

For Rolling Mills, Blast Furnaces, Foundries, Gas Works, Lime Kilns, Tanneries, Boiler and Grate Setting, Glass Works, &c.

FIRE CLAYS, FIRE SAND, AND KAOLIN FOR SALE

M. D. Valentine & Bro

Manufacturers of

FIRE BRICK And Furnace Blocks

DRAIN PIPE & LAND TILE.

Woodbridge, - - - N. J.

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Proprietor of the

Excelsior Fire Brick & Clay Retort Works,

Manufacturer of FIRE BRICK, HOLLOW BRICK AND CLAY RETORTS.

WORKS: PERTH AMBOY, NEW JERSEY.

Office & Depot: 418 to 422 East 23d St., N. Y.

B. KREISCHER & SON.,

New York Fire Brick & STATEN ISLAND CLAY RETORT WORKS,

Established 1845.

Office, foot of Houston Street, East Rever, NEW YORK.

The largest stock of Fire Brick of all shapes and sizes on hand, and made to order at short notice.

Cupola Brick, for McKenzie Patent, and others. Fire Mortar, Ground Brick, Clay and Sand. Superior Kaolin for Rolling Mills and Foundries. Stone Ware and other Fire Clay and Sand, from my own mines at New Jersey and Staten Island, by the cargo or otherwise.

Brooklyn Clay Retort AND FIRE BRICK WORKS.

Manufacturers of Clay Retorts, Fire Bricks, Gas House and other Tile, Cupola Brick, &c. Dealers in and Miners of Fire Clay and Fire Sand. Clay bank at Burt's Creek, New Jersey. Manufactory: Van Dyke, Elizabeth, Richards and Partition Sts., Brooklyn, N. Y. Office No. 88 Van Dyke St.

MANHATTAN FIRE BRICK

and Enameled Clay Retort Works.

ADAM WEBER, Proprietor.

Office, 633 E. 15th St., N. Y. Clay Retorts, Enameled for Gas Houses; Retorts for burning raw bone and re-burning bone for Bone Black. Fire Bricks, Fire Blocks, Cupola and Range Bricks of all shapes and sizes. The best fire clay from my own Clay Beds at Perth Amboy, N. J.

A. HALL & SONS, Perth Amboy, N. J.

ESTABLISHED 1846.

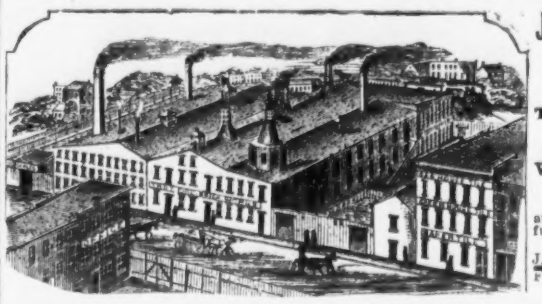
HALL & SONS, Buffalo, N. Y.

ESTABLISHED 1866.

FIRE BRICK

of reliable quality for all purposes, manufactured of the best New Jersey Fire Clays. Also, Architectural Terra Cotta, Fire Clay, Fire Sand, Kaolin, Ground Fire Brick and Diamantine Building Brick.

TROY FIRE BRICK WORKS,



Jas. Ostrander & Son,

Established 1848.

Manufacturers of

FIRE BRICK,

Tuyeres, Tiles, Blast Furnace Blocks, etc.

Miners and Dealers in

Woodbridge Fire Clay and Sand, and Staten Island Kaolin.

Price List, Diagrams of Fire Brick, and all other information cheerfully furnished on application.

TROY, N. Y.

JAMES OSTRANDER.

FRANCIS A. OSTRANDER, Surviving partner.

CUMBERLAND FIRE BRICK WORKS

GARDNER, STUART & CO.,

MANUFACTURERS OF

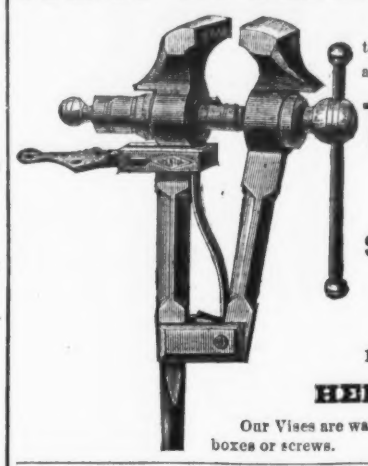
STANDARD SAVAGE FIRE BRICK.

OFFICE: Room 3, No. 96½ Fourth Avenue, PITTSBURGH, PA.

WORKS: One Mile from Mt. Savage Junction, Md., B. & O. R. R.

Illustrated Circulars and Price Lists on application.

NEW MODEL SWIVEL VISE.



The advantage claimed for this Vise over the ordinary patterns is in the case with which it is adjusted to whatever angle may be required.

Trenton Vise & Tool Works

TRENTON, N. J.,

Manufacturers of

Solid Box Vises, Hammers Sledges, Picks, Mattocks, Grub Hoes, &c.

Warehouse,

101 & 103 Duane Street, NEW YORK.

HERMANN BOKER & CO.

Our Vises are warranted to do more work than any other make. No broken boxes or screws.

Harvey W. Peace, Vulcan Saw Works.

Manufacturer of every kind of

Patent Ground SAWS.

TRADE MARK. HARVEY W. PEACE & Co.

Circulars, Cross-Cuts, Mill, Mulay, Gang, Hand, and Butcher.

Molding and Planing Knives, Plastering Trowels, Mitering Rods, &c.

Union Avenue, Tenth and Ainslie Streets, BROOKLYN, E. D., N. Y.

E. M. BOYNTON,

Manufacturer of all kinds of

First-Class Saws, Saw Frames, Cross-Cut Handles, Tools, Files, &c.

Also Sole Proprietor and Mfr. of the Genuine Patent Lightning Saw,

No. 80 Beekman Street, NEW YORK.

Special attention is called to my new Centennial Saw, patented March 28th, 1876; Special File and Saw-Set combined, patented June 20th, 1876; Cross Cut (Loop) Saw Handle, patented February 15th, 1876; New One-Man Saw, with Patent Double Removable Handle Attachment, March 28th, 1876; New Patent Champion Clearer Tooth, patented August 15th, 1876 Saw Set, patented Nov. 25th, 1873—a perfect Set tha ta blind man can use to condense like a Hammer Set perfectly; Cross-bar Wood Saw Frame, patented Nov. 12, 1872; also Cross-Cut Handle, with castings, patented Feb. 15, 1870.

These goods complete the scientific tools for cutting timber, instead of wearing it off with notched V teeth (which are like a fractured plate sharpened).

AWARDED CENTENNIAL MEDAL AFTER ACTUAL TEST.

PHILADELPHIA, November 11th, 1876.

REPORT ON AWARDS. GROUP No. 15.

Product: Saws in great variety; special improvement in shape of teeth, called Patent Lightning Saw.

Name and Address of Exhibitor: Eben Moody Boynton, New York.

The undersigned having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for award, for the following reasons, viz:

Report: "Being of very Superior Quality and of great Practical Utility." DANIEL STEINMETZ, Signature of the Judge.

J. D. IMBODEN, of Virginia, CHARLES STAPLES, of Maine, G. L. REED, of Penn., } JUDGES.
J. DIFENBACH, of Germany, DAVID McHARDY, of Scotland, D. STEINMETZ, of Phila. }

A true copy of the record. FRANCIS A. WALKER, Chief of the Bureau of Awards.

Given by authority of the U. S. Centennial Commission.

J. L. CAMPBELL, Sec'y. A. T. GOSHORN Director General. J. R. HAWLEY, Prest.

Wheeler, Madden & Clemson

MFG. CO.,

MIDDLETOWN, - - - - NEW YORK.

Manufacturers of

WARRANTED CAST STEEL

SAWS

Of every description, including

Circular, Shingle, Cross-Cut, Mill, Hand, WOOD SAWS. Etc., Etc.

AMERICAN SAW CO.,

Manufacturers of

Movable Toothed Circular Saws, PERFORATED CROSS-CUT SAWS

And SOLID SAWS of all kinds. Trenton, N. J.

New York Wholesale Prices, September 19, 1877.

HARDWARE.

Anvils.
American ... ℘ ℔ 15c—dis 20 %
Wright's ... ℘ ℔ gold 10½c; over 250 ℔s 11c, gold
Armitage's Mouse Hole ... gold 10 @ 10½c
Wilkinson's ... ℘ ℔ gold 11c
Eagle Anvils (American) ... ℘ ℔ 9c dis 20 %

Apple Parers.
Bay State Parer, Corer and Slicer ... ℘ doz $12.00 net
Improved Turn Table ... ℘ doz 7.50 net
Faultless Turn Table ... ℘ doz 7.50 net
New Lightning ... ℘ doz 7.50 net
"Old Reliable" ... ℘ doz 5.00 net
Climax Corer and Slicer ... ℘ doz 6.00 net
Lightning Peach Parer ... ℘ doz 12.00 net

Augers and Bits.
Conn. Valley Mfg. Co., Douglass Mfg. Co., Ives, Beecher (French, Swift & Co), Griswold, Nobles Mfg. Co, Kasson's Patent ... 1st quality .. dis 50 % .. 2d quality .. dis 50&5 %
Cook's, Douglass Mfg. Co ... dis 50&5 %
Cook's, Ives' ... dis 50 %
Snell Mfg. Co ... dis 30&10 %
Jennings' Bits ... dis 10 %
Ives' "Jennings" Bits ... dis 10&10 %
Lewis' Single Twist Bits ... dis 33⅓ %
Andrews Bits ... dis 50 %
Griswold's Patent Bits ... dis 30 %
Expansive Bits, Clark's, small, $18; large, $26 .. dis 20 %
" " Ives' ... $20 @ $30—dis 33⅓ %
" " Blake's ... $20—dis 40 %
" " Parmelee's ... small, $20; large, $36 ... dis 25 %
Hollow Augers, Ives' ... } dis 40 %
" " French, Swift & Co ... }
" " Bonney's Adjust., ℘ doz $48—dis 25&10 %
" " Stearns' Adjust., ℘ doz $48—dis 25&10 %
" " Ives' Expansive ... each $4.50—dis 40 %
" " Univ'sal Expansive, each $4.50—dis 10 %
Gimlet Bits—Screw, $7.50; no screw, $9 ... dis 40 %
" Diamond ... ℘ doz $1.00 dis 10 %
Double Cut Gimlet Bits, Shepardson's ... dis 30 %
" " Ct. Valley Mfg. Co ... dis 30&10 %
" " Hartwell's ... dis 50&10 %
" " Douglass' ... dis 25&10 %
" " Ives' ... dis 40 %
Morse's Bit Stock Drill, List of Jan. 1, '76 ... dis 25 %
L'Hommedieu's Ship Augers ... dis 15 %
Watrous Ship Augers ... dis 15 %

Awls, Brad Sets, &c.
Awls, Sewing, Common ... ℘ gross $1.35—dis 25 %
" Sewing, Best ... ℘ gross 1.60—dis 10 %
" Shouldered Peg ... ℘ gross 2.25—dis 15 %
" Patent Peg ... ℘ gross .60—dis 15 %
" Shouldered Brad ... ℘ gross $2.70—dis 25&10 %
Brad Sets, Aiken's ... ℘ doz $12.00—dis 40 %
" No. 42, $10.50; No. 43, $12.50 ... dis 60 %
" Clark's ... dis 50 %
" Stanley's Excelsior. No. 1, $11.00—dis 25&10 %

Axes.
Ten Eyck Axe Mfg. Co.—
Per doz $11.50, 12.00, 12.50 ... dis 15&5 %

Axles.
Common (Guy C. Hotchkiss, Field & Co.) ... ℘ ℔ 4⅝c
Solid Collar, Case Hardened, Chilled Box ... ℘ ℔ 8c

Axle Grease.—Frazer's ... ℘ ℔ 6c

Balances.
Light or "Common" ... dis 25&10 %
All other Spring Balances ... dis 25 %

Bands.—Plated ... new list dis 50&5 %
Iron Rim ... new list dis 25&5 %
Brass (Plated list) ... new list dis 50, 10&5 %
Oroide ... new list dis 50&5 %

Bed Keys.
Gray's Ratchet ... ℘ doz $4.00, dis 15 %

Bells.
Hand, Light Brass ... dis. 75 %
" Extra Heavy ... dis 40&10 %
" White Metal ... dis 50&10 %
" Silver Chime ... dis 20&10 %
" Swiss ... dis 25 %
" Globe (Cone's Patent) ... dis 20&10 %
Gong, Abbe's ... dis 20&10 %
" Yankee ... dis 35&10 %
" Barton's ... dis 40&2 %
Crank, Taylor's ... dis 25&10 %
" Brook's ... dis 50 %
" Cone's ... dis 10 %
" Connel's ... dis 50&10 %
Lever, Sargent's ... dis 60&10&10 %
" Taylor's Bronze or Plated Lever ... net
" " Japanned Lever ... dis 25&10 %
" Hart, Bliven & Mead Mfg. Co ... dis 50&10 %
Pull, " " " " ... dis 50&10 %
" Brook's ... dis 50 %
" Western ... dis 25&10 %
Call ... dis 20 %
Cow, Common Wrought ... dis 20&10 %
" Western ... dis 20&10 %
" " Sargent's ... dis 60&10 %
" Kentucky "Star" ... dis 20&10 %
" " Sargent's ... dis 60&10 %
" Dodge's Genuine Kentucky, new list—

Nos.	0	1	1½	2	3	4	5	6	Hog.
	$12.00	10.00	9.00	8.00	6.00	5.00	3.50	2.50	5.00, dis 50 %

" Yaw's Genuine ... dis 50 %
" Texas ... dis 40 %

Bellows.
Blacksmiths', Common ... dis 20 @ 25 %
" Extra and Pittsburgh Pattern ... dis 20 %
Moulders' ... dis 25 %
Hand Bellows ... dis 20 %

Blind Adjusters.—Domestic ... ℘ doz $3.00, dis 20 %

Blind Fasteners.
Mackrell's ... dis 30 %
Van Sand's ... No. 2000, $14.00, dis 25 %
" old pattern ... ℘ gross, $10.50, dis 5 %
Washburn's Patent ... ℘ gross $14.00, dis 25 %
Merriman's ... new list net
Security Blind Fast ... ℘ gross $14.00, dis 10 @ — %

Blind Staples.
Boardman's Patent, ½ in. and larger ℘ ℔ 41c. dis 10&5 %
" ⅜ in ... ℘ ℔ 46c. dis 10&5 %

Blocks.
Differential Pulley Blocks ... dis 20 %
Tackle, Rope and Iron Strapped, Providence Tool Co.'s list ... dis 30&10 %
Stanley Rule and Level Co ... dis 25&10 %

Blowers.
Keystone Portable Forge Co ... dis 20 %

Bolts.
Cast Iron Barrel, Shutter, &c ... dis 60&10&10 %
Cast Iron Chain ... dis 60&10&10 %
Wrought Iron Barrel ... dis 50, 10&10 %
" " Square ... dis 50, 10&10 %
" " Shutter (Stanley's list) ... dis 50 %
" " " (Sargent's new list). dis 50, 10&10 %
" " Flush, Stanley's ... dis 15&10 %
" " " Sargent's ... dis 50&10&10 %
Carriage and Tire, Common ... dis 75&3 % cash
" " Norway Iron ... dis 70 %
" " R. B. & W ... (old list) dis 65 %
" " Philadelphia ... dis 60&10 %
" " Colema ... dis 60&10 @ 60&20 %
" " Shelton's ... (old list) dis 65&5 %
Star (Phila) ... dis 60&10&60&20 %
Union Nut Company, old list ... dis 60&5 %
Stove—American Screw Co.'s ... dis 45 @ 50 %
" R. B. & W ... dis 50 %
" Shelton's Shaved Head ... dis 45 @ 50 %
" Union Nut Co ... dis 45 %
Plow, R. B. & W ... dis 40 %
Machine ... dis 70 %
Bolt Ends ... dis 60 %

Borax ... 12 @ 12½c ℘ ℔

Boring Machines.

	Upright.	Angular.
Hovey's, no Augers	$3.00	$4.00 net
" with Augers	5.00	6.00 net
Parr's, no Augers	5.00	7.50 dis 30 %
" with Augers	7.50	10.00 dis 30 %
Kellogg's, no Augers	5.25	6.75 dis 15 %
Sweets' "	3.25	4.00 net
" with Augers	5.00	6.00 net
Snell's, no Augers	4.75	6.25 dis 25 %
Phillips' with Augers	....	10.00 dis 25 %

Bow Pins.
Union Nut Co ... dis 60&5 %
Hotchkiss' ... low list dis 10 %
Humason, Beckley & Co.'s ... dis 60 %
Sargent & Co.'s ... $19.70 and $21.40, dis 60&10 %

Braces.—Barber's Patent ... dis 40&5 %
O. S. Backus ... dis 50 %
Wilson Mfg. Co ... dis 10 %
Spofford's Patent ... dis 50 %
Noble's Patent ... dis 40&5 %
Ives' "Centennial" ... dis 40&10 %
Common Ball (American) ... dis 25&10 %

Brackets.—Shelf ... dis 60&10 @ —&10 %
Bright Wire Goods ... dis 65&10&10 %
Bull Rings.—Union Nut Co ... dis 50&20 %
Sargent's ... dis 66⅔&10 %
Hotchkiss' ... low list dis 10 %
Humason, Beckley & Co.'s ... dis 60 %
Union Nut Co ... dis 60&5 %

Butchers' Cleavers.
Humason & Beckley Mfg. Co ... dis 20 %
D. R. Barton Tool Co ... dis 20 %
Bradley's ... dis 25 %
Beatty's ... dis 20 %

1	2	3	4	5	6	7	8
$16.50	19.00	21.50	24.00	27.00	30.00	33.50	36.50

Hart Mfg. Co ... dis 50&10 %

0	1	2	3	4	5	6
$20.00	26.00	29.50	33.00	37.00	41.50	45.00

Butts.
Wrought Brass ... dis 55&10 @ 60&10 %
Cast Brass ... dis 20 %

COMMON CAST, NOT DRILLED.
Fast Joint, Narrow ... dis 50 %
" Broad ... dis 60 %
Loose Joint, Narrow and Broad ... dis 65 %
Parliament Butts and Mayer's Hinges ... dis 6 %
Loose Pin ... dis —
Loose Pin Japanned ... dis —
Loose Pin Jap'd, Plated Tips ... dis —

DRILLED AND WIRED.
Fast Joint, Narrow ... dis 45 %
" Broad ... dis 55 %
" Broad, Japanned ... dis 50 %
Loose Joint ... dis 62½ %
" Japanned ... dis 62½ %
Parliament and Mayer's Hinges ... dis 50 @ 60 %
Loose Pin, no Acorn ... dis 65 %
" Acorns ... dis 62½ %
" " Japanned ... dis 65 %
" " Plated Tips ... dis 62½ %
(10 per cent. extra discount.)

Union Mfg. Co.'s Fancy Butts—
Figured Enameled Loose Joint ... dis 65&10 %
Boston Finish, Plain ... dis 80&10 %
" " with Iron Acorns ... dis 75&10 %
" " with Silvered Acorns ... dis 65&10 %

WROUGHT IRON.
Fast Joint, Narrow ... dis 40&10 %
" Lt. Narrow ... dis 30&10 %
" Broad ... dis 40&10 %
Loose Joint, Broad ... dis 40&10 %
Table Butts, Back Flaps, &c ... dis 35&10 %
Inside Blind, Regular ... dis 35&10 %
" " Light ... dis 40&10 %
Loose Pin, Wrt ... dis 40&10 %
Am. Spiral Spring Butt Co., Japanned ... dis 25 %
" " Fancy ... dis 10 %
Sabin Mfg. Co., Double Acting ... dis 35 %
Union Spring Hinge Co ... dis 25 %
" Mfg. Co. Spring Hinges ... dis 25 %
Blind Butts, Parker ... dis 60&10 %
" Palmer ... dis 40&10 %
" Seymour ... dis 60&10 %
" Shepard ... dis 60 %
" Lull & Porter ... dis 60 %
" Nicholson ... dis 45&10 %
" Huffer ... dis 33⅓&10 %
" Garretson ... dis 60 %
" Clark's, Nos. 1, 3, 5, 40 and 50 ... dis 60 %
" " Nos. 2, 4, 4½, 6, 8, 10 ... dis 50&10 %
" Sargent's ... dis 70&5&10 %

Can Openers.
Messenger's Comet ... ℘ doz $3.00, dis 20 %
American ... ℘ doz $2.25, dis 50&5 %
Lyman's ... ℘ doz $3.75, dis 20 %
No. 4, French ... ℘ doz $2.25, dis 50 %
No. 5, Iron Handle ... ℘ doz $2.25, dis 50&5 %
Sprague's ... Nos. 1, 2, 3 — ℘ doz $2.00, 2.25, 2.50, dis 25 %
Eureka ... ℘ doz $2.50, dis 10 %
Sardine Scissors ... ℘ doz $7.00, dis 40 @ 40&5 %
Star ... ℘ doz $5.00, dis 25 %

Caps—Percussion, ℘ 1000.
Hicks & Goldmark's G. D. & S. R ... 37 @ 40c
" " E. B. 1-10 Ground ... 70c, dis 6 %
" " E. B. 1-10 Turned ... 65c, dis 5 %
" " D. W. P. 1-10 ... $1.40, dis 5 %
" " D. W. P. ¼ ... 1.35, dis 5 %
" " Colt's 1-10 ... 70c, dis 5 %
Ely's E. B ... 1-48, 58c.; 1-108, 70c. gold
" Double Waterproof, 1-48, $1.50; 1-108, $1.58c, gold
Colt's ... 1-108, 80c, gold

Cartridges.—Metallic ... dis 62½ %
Cards.—Horse and Curry ... dis 30&10 %
Cotton ... dis 10&10 %
Wool ... dis 15&10 %

Carpet Stretchers.
Cast Steel, Polished ... ℘ doz $5.00, dis 30 %
" Iron, Steel Points ... ℘ doz $2.00, dis 45&5 %

Casters.
Bed ... dis 55 %
Plate and Shallow Socket ... dis 55 %
Deep Socket ... dis 40 %

Cattle Leaders.
Hotchkiss' Sons' ... dis 10&10 %
Humason, Beckley & Co.'s ... dis 60 %
Sargent's ... dis 60&10 %
Union Nut Co ... dis 60&5 %

Chain.
Trace, 6½-10-2 ... by the cask, ℘ pair, gold, 50 @ 52c
" 7-10-2 ... by the cask, ℘ pair, gold 55 @ 57c
German Halter Chain ... dis 30&5 % gold
" Coil ... dis 30&5 % gold
Galvanized Pump Chain ... ℘ ℔ 10½c
Jack Chain, Iron ... dis 55&10 %
" Brass ... dis 45&10 %

Chalk.
White ... ℘ gross 55c net
Red ... ℘ gross 75c net
Blue ... ℘ gross 90c net
White Crayons ... ℘ gross 13½c net

Chisels.
D. R. Barton Tool Co. (all kinds) ... dis 20 %
Socket Framing, Crossman ... dis 60&5&10 %
" " Buck Bros ... new list, dis 17½ @ 20 %
" " Hart Mfg. Co., No. 1 ... dis 65&5&10 %
" " Merrill ... dis 60&10 %
" " Witherby Tool Co ... dis 60&10 %
" Firmers, Crossman ... dis 60&10 %
" " Buck Bros ... new list, dis 17½ @ 20 %
" " Hart Mfg. Co., No. 1 ... dis 65&5&10 %
" " Merrill ... dis 60&10 %
" " Witherby Tool Co ... dis 60&10 %
" Corner ... dis 65&70 %
Tanged Firmers extra ... dis 40 %
" " Butcher's ... $5.00 @ $5.25 to £ gold
" " Newbould's ... 5.50 to £ gold
" " Spear & Jackson's ... 5.00 to £ gold
" " Buck Bros (Shank) ... 5.25 to £ gold

Clamps.
Iron, Providence Tool Co.'s, Wrt. Iron ... dis 25 %
" Adjustable, Gray's ... dis 20 %
" " Lambert's ... dis 20 %
" " Snow's ... dis 40&5 %
" " Hammer's ... dis 15 %
" Cabinet, Sargent's ... dis 60&10 %
" Carriage Makers', Sargent's ... dis 60&10 %

Coffee Mills.
Board and Box ... dis 25 %
Increase Wilson's ... dis 25 %
Selsor's Pat ... $9.50, $10.50, dis 25 %
American (Enterprise Mfg. Co.) ... dis 20 %
French Steel ... dis 20 %
The Swift ... dis 25 %

Compasses and Dividers ... dis 35&10 %
Bemis & Call Co.'s ... dis 35&10 %
Cook's ... dis 15 %
Excelsior ... dis 40 %
Miller's Patent ... dis 25&10 %

Coopers' Tools.
Bradley's ... dis 15 @ 20 %
Chas. E. Little ... dis 20 @ 25 %
D. R. Barton Tool Co ... dis 20 %

Corkscrews.—Humason & B ... dis 33⅓ %
Corn Knives and Cutters.
Bradley's ... dis 10 %

Crow Bars.
Cast Steel ... ℘ ℔ 9c net
Iron, Steel Points ... ℘ ℔ 5c

Crucibles.—Gautier & Co ... ℘ No. 5½c

Curling Irons, &c.
⅛, ⅝, ¾ in.. $1.80, 2.00, 2.40 ... dis 10 %
Curling Tongs ... ℘ doz $6.50, dis 15 %
Pinching Irons ... ℘ doz 7.50, dis 20 %

Curry Combs.
Curry Comb Mfg. Co ... dis 25&10 %
Fitch's (List of No. 240, $1) ... dis 30&10 %
Hotchkiss' & Kellogg's, Iron & Brass, old list. dis 40&7½ %
Hotchkiss' Novelty ... dis 10&10 %
Rubber ... ℘ doz $9.00, dis 15 %
Wood Tooth (Fuller Bros.) ... ℘ doz $2.25, net

Clips, Axle.
Norway or Best ... dis 50 %
Superior ... dis 55 %

Cockeyes ... 1¼ in., 28c.; 1½ inch, 33c.; 1¾ in., 37c, net

Cocks.
Brass Racking ... dis 50 %
Lock and Globe ... dis 50 %
Lever Bibbs ... dis 50 %
Ale and Beer ... dis 40&45 %

Curtain Pins.—Silvered Glass ... new list, dis 15 %

Cutlery.
Meriden Cutlery Co. (Table) ... net
Am. Miller Bro.'s Cutlery Co ... dis 25 %
Naugatuck Cutlery Co ... list net
New York Knife Co. (Pocket) ... dis 35&5 % cash
" " (Table) ... net
Rogers Cutlery Co ... net
Humason & Beckley Mfg Co ... dis 25 %

Dippers.
Britannia ... ℘ doz $3.75 @ $4.25, net
Cocoa, Plain ... ℘ doz $3.25, dis 20 %
" Rimmed ... ℘ doz 3.75, dis 20 %

Dog Collars.
Embossed Gilt ... dis 20 %
Leather ... dis 30 %
Brass ... dis 25 %

Door Springs.
Torrey's Rod ... ℘ doz $2.00 @ $2.10, net
Gray's " ... ℘ doz $2.00, net
Johnson's Rod ... ℘ doz 3.00, net
Gem (Coil)—
No. 1, Large, Japanned ... ℘ doz $3.50 }
No. 2, Medium, " ... ℘ doz 2.50 } dis 10 %
No. 4, Small, " ... ℘ doz 2.0? }

Challenge (Coil)— Nos.	9	7	6	
Japanned ... ℘ doz	$2.00	2.50	3.50	dis 15 %
Coppered ... ℘ doz	4.00	4.50	5.00	
Galvanized ... ℘ doz	3.50	4.00	4.50	
Nickeled ... ℘ doz	5.50	6.00	7.00	

Premium (Coil)— Nos.	1	2	3	
Japanned ... ℘ doz	$7.50	6.25	5.00	dis 30 %
Nickeled ... ℔ doz	11.00	9.50	8.00	

Star (Coil)—For Cop'd, Nickel-Plated, &c., see list.
No. 5, Small ... ℘ doz $2.00 }
No. 6, Medium ... ℘ doz 2.50 } dis 15 %
No. 7, Large ... ℘ doz 3.50 }
Philadelphia ... 5 in., $5.00; 8 in., $7.00, dis 25 %
Barker's Concealed ... dis 15 %

Drawing Knives.
Crossman's No. 1 ... dis 60&10 %
D. R. Barton Tool Co ... dis 20 %
Hart Mfg. Co., No. 1 ... dis 65&5&10 %
Merrill ... dis 60&10 %
Nobles Mfg. Co ... dis 15 %
Bradley's ... dis 25 %
Adjustable Handle ... dis 20 %
Witherby Tool Co ... dis 60&10 %

Drills and Drill Stocks.
Blacksmiths' ... each $2.10 @ $2.25
" Self-Feeding ... each $7.50, dis 10 %
Breast, P. S. & W ... dis 25 %
Breast, Aiken's ... dis 25&10 %
" Hotchkiss ... dis 10 %
" Wilson's ... dis 10 %
" Miller's Falls ... each $2.50, dis 25 %
Ratchet, Merrill's ... dis 25 %
" Ingersoll's (old list) ... dis 35 %
" Whitney's ... dis 20 %
" Weston's ... dis 20 %
" Moore's Triple Action ... dis 20 @ 25 %
Wilson's Drill Stocks ... dis 10 %
Automatic Boring Tools ... each $2.75, dis 20 %

Drill Chucks.
Danbury ... each $8.00, dis 30 %
Morse's Beach Patent ... dis 30 %
" Adjustable ... each $10.00, dis 30 %

Egg Beaters.
Dover ... ℘ doz $5.00, dis 20 %
National ... ℘ doz $4.50, dis 33⅓ %
Schofield ... ℘ doz $3.50

Emery.
Genuine Chester—Regular Nos ... ℘ ℔ 6c } dis 10 %
" " Flour and FF ... ℘ ℔ 4c }
Washington Mills—Regular Nos ... ℘ ℔ 8c
" Flour ... ℘ ℔ 5c
Wellington Mills, Grain ... ℘ ℔ 10c net
" " Flour ... ℘ ℔ 8c net

Enameled and Tinned Ware.
Kettles ... dis 40 @ 50 %
Sauce Pans ... dis 30 @ 35 %
Glue Kettles ... dis 30 @ 35 %
Tinned Sauce Pans ... dis 30 @ 35 %

Escutcheons.
Door Lock ... Same discounts as Door Locks
Brass Thread ... dis 60&10 %
Wood ... dis 25 %

Faucets.
Fenn's ... dis 50 %
Fenn's Cork Stops ... dis 40 %
Star ... dis 55&10 %
Frary's Patent Petroleum ... dis 20&10 %
Wood and Metallic ... dis 40 %
" Cork Lined ... dis 65&10 %
Enterprise Mfg. Co., Self-Measuring ... dis 20 %

Felloe Plates ... ℘ ℔ 15c, dis 40&10 %

Files.
American File Co ... $5.00 to £ currency, dis 40 %
Arcade File Works ... $5.00 to £ currency, dis —
Auburn " ... 5.00 to £ currency, dis —
C. B. Paul's ... 5.00 to £ currency, dis —
Heller & Bros ... $5.00 to £ currency, dis 15 @ 20 %
Madden & Cockayne File Co ... $5.00 to £ cur., dis 25 %
Jowitt's ... $4.50 to £ gold
J. & Riley Carr ... 4.50 to £ gold
Stubs' ... 7.50 to £ gold
Butcher's ... 4.50 to £ gold
Walter Spencer & Co.'s "Diamond" ... 4.50 to £ gold
Fisher's ... 4.75 to £ gold
Moss & Gamble ... 4.75 to £ gold
Thos. Turner & Co. (Peter A. Frasse & Co.) 4.50 to £ gold
" " Horse Rasps ... 4.75 to £ gold
H. Disston & Sons (new list) ... dis 30 %
Limet & Co. (French) ... $4.25 to £ gold
Boyton's Cant ... dis 40 %
Rothery ... dis 25 %

Fluting Machines.
Mrs. Knox, No. 1876 ... each $2.75 to $3.00 net
Knox Imperial, 1877 ... $5.20, dis 30&10&10 %
Knox, 4-inch Rolls ... $2.50 each net
" 6 " " ... 3.00 each net
" 8 " " ... 4.50 each net
Peerless, 4-inch Rolls ... 4.00 each net
" 5 " " ... 4.75 each net
Improved Knox (Climax), 4-inch ... 2.65 each net
" " " 6 " ... 3.15 each net
" " " 8 " ... 4.90 each net
Eagle, 3½-inch Roll ... $18.00 ℘ doz, dis 5 %
" 5½ " " ... 24.00 ℘ doz, dis 5 %
Empire ... $4.00 each net
Eureka, No. 1, 7-inch Roll ... 6.75 each net
" No. 2, 5-inch Roll ... 5.00 each net
Crown, 4½-in. Roll, $2.35; 6-in., $2.75; 8in., 4.00 each net
Domestic Fluter ... 1.50 each net
Geneva Hand Fluter ... 15.00 ℘ doz net
Combined Fluter and Sad Iron ... ℘ doz 15.00, dis 10 %

Fluting Scissors ... dis 35&10 %

Forges.
"Empire" (W. P. Kellogg & Co.) ... dis 20 %
Keystone Portable Forge Co ... dis 20 %

Forks.
Hay, Manure and Spading ... dis 35 %
Plated A 1 ... dis 40&5 %
" Reed & Barton ... dis 40&5 %

Fruit and Jelly Presses.
Enterprise Mfg. Co ... dis 20 %

Fry Pans.
Burnished, P. S. & W., new list ... dis 60 %

No.	0	1	2	3	4	5	6	7	8
℘ doz...	$3.00	$3.75	4.25	4.75	5.25	6.00	7.00	8.00	9.00

Gauges.
Marking ... dis 45&10 %
" Star ... dis 35 %
Wire ... dis 10 %
" Smith's Patent ... ℘ doz $18.00, dis 40 %

Gimlets.
Nail and Spike ... dis 40 %
"Bee" Gimlets ... ℘ gross $12.00, dis 45 %
"Eureka" Gimlets ... dis 40 %
Double Cut, Shepardson's ... dis 20 %
" " Hartwell's ... dis 40 %
" " Ives' ... dis 33⅓ %
" " Douglass' ... dis 25&10 %

Glue Pots.
Tinned and Enameled ... dis 35 @ 40 %
Family, Howe's "Eureka" ... dis 25 %
" L. F. & C.'s "Handy" ... dis 25 %

Grindstone Fixtures.
Sargent's Patent ... dis 70&10&10 %
Reading Hardware Co (New list) ... dis 40&10 %
Hart Mfg. Co., Nos 9 to 11 ... dis 75&7½&10 %
Rick Bros ... dis 45&5 %

Hammers.
Humason & Beckley Mfg. Co ... dis 33⅓ %
Maydole's (New list, Jan. 1, '77) ... dis 15 %
Henry Hammonds' (New list, Jan. 1, '77) ... dis 15&5 %
Cheney's Steel Face and Claw ... dis 10 %
" all Steel ... dis 20&10 %
Verree ... dis 5 %
Magnetic Tack ... dis 25&10 %
Warner & Noble's ... dis 10 %

Hand Cuffs and Leg Irons.
Tower's Hand Cuffs, $4.00 ℘ pair ... } dis 25 %
" Leg Irons, $6.50 ℘ pair ... }
Providence Tool Co.'s Hand Cuffs, $15.00 ℘ doz } dis 10 %
" " Leg Irons, $25 ℘ doz ... }

Handles.
Door or Thumb Latches—

Nos.	0	1	2	3	4	
Per doz...	$0.80	1.00	1.18	1.35	1.50	...dis 60&10 %

Roggin's Latches ... 35c @ 40c net
Bronzed Iron Drop Latches ... ℘ doz $1.00 @ $1.25 net
Wrought Chest ... dis 60&10 %
Surface Chest, Sargent's list ... dis 60&10&10 %
Flush Chest ... dis 60&10&10 %
Lifting ... dis 60&10 %
Saw and Plane ... dis 25&10 %
Boynton's X Cut (Loop) ... dis 20 %
" " (Centennial) ... dis 15 %
Hammer and Hatchet ... dis 10 %
North Carolina Handle Co ... dis 15 %
Brad Awl ... ℘ gross $3.75, dis 25&10 %
Hickory Firmer Chisel, assorted, ℘ gross $5.25 }
" " " large, 6.50 }
Apple " " assorted, " 6.00 }
" " " large, " 7.50 }
Socket " " assorted, " 4.50 } dis 40 %
" Framing " assorted, " 7.00 }
File, assorted, ℘ gross ... 3.50 }
Auger, assorted, ℘ gross ... 6.00 }
" large, " ... 7.00 }
Patent Auger, Ives' ... dis 25&10 %
" Douglass' ... ℘ set $1.25, dis 10 %
" Swan's ... ℘ set $1, dis 20&10 %

Hangers.
Barn Door ... dis 70&10 %
"Anti-Friction," No. 1, $1.25; No. 2, $1.50 ℘ pr., dis 40&10 %
Novelty ... dis 40 %
Challenge ... dis 50 %
Climax ... dis 40 %

Harness Snaps.
Henshaw's ... List of 1½ changed to $14.00, dis 45 @ 50 %
Judd's ... " " " 14.00, dis 50 %
Fitch's (Bristol) .. " " " 14.00, dis 45&50 %
Hotchkiss' ... dis 10 %
Andrews' ... dis 45 %
Sargent's ... dis 60&10 %
New York Wire ... dis 20&20 %
"German" ... dis 50 %

Hatchets.

	Nos.		1	2	3
Isaiah Blood ... dis 15 %					
Shingling,	Nos. 1 2 3	℘ doz	$7.25	$8.00	$8.75
Claw,	Nos. 1 2 3	℘ doz	7.75	8.50	9.25
Lathing,	Nos. 1 2 3	℘ doz	7.50	8.00	8.50
Hunt's ... dis 25 %					
Shingling,	Nos. 1 2 3	℘ doz	$7.25	$8.00	$8.75
Claw,	Nos. 1 2 3	℘ doz	7.75	8.50	9.25
Lathing,	Nos. 1 2 3	℘ doz	7.50	8.25	9.00
Hurd's ... dis 30&10 %					
Shingling,	Nos. 1 2 3	℘ doz	$8.00	$8.50	$9.00
Claw,	Nos. 1 2 3	℘ doz	9.00	9.50	10.00
Lathing,	Nos. 1 2 3	℘ doz	8.00	8.50	9.00

Simmon's ... dis 35 %

	Nos.					
Shingling,	Nos. 0 1 2 3	℘ doz	$7.50	$8.00	$8.50	$9.00
Claw,	Nos. 1 2 3	℘ doz		9.00	9.50	10.00
Lathing,	Nos. 1 2 3	℘ doz		8.00	8.50	9.00
Broad,	Nos. 1 2 3 4	℘ doz	9.00	10.00	12.00	14.00
"	Nos. 5 6 7 8	℘ doz	16.00	18.00	20.00	22.00

Collins' ... dis 10 %

	Nos.				
Shingling,	Nos. 1 2 3	℘ doz	$6.00	$6.50	$7.00
Claw,	Nos. 1 2 3	℘ doz	6.50	7.00	7.50
Lathing,	Nos. 1 2 3	℘ doz	6.00	6.50	7.00

Ten Eyck Axe Mfg. Co ... dis 35 %

	Nos.				
Shingling,	Nos. 1 2 3	℘ doz	$8.00	$8.50	$9.00
Lathing,	Nos. 1 2 3	℘ doz	8.00	8.50	9.00
Claw,	Nos. 1 2 3	℘ doz	9.00	9.50	10.00
Broad,	Nos. 3 4 5	℘ doz	13.00	14.50	16.90
"	Nos. 6 7 8	℘ doz	18.00	19.50	22.00
"	No. 9	℘ doz	25.00		

D. R. Barton Tool Co ... dis 20 %

	Nos.				
Shingling,	Nos. 1 2 3	℘ doz	$11.00	$10.50	$10.00
Lath,	Nos. 1 2 3	℘ doz	10.50	10.00	9.50
Half Hatchets,	Nos. 1 2 3	℘ doz	11.00	10.50	10.00

J. P. Perree & Co ... dis 5 %

	Nos.				
Shingling,	Nos. 1 2 3	℘ doz	$7.00	$7.50	$8.00
Claw,	Nos. 1 2 3	℘ doz	7.50	8.00	8.50
Lathing,	Nos. 1 2 3	℘ doz	7.00	7.50	8.00

Underhill's ... dis 20 %

	Nos.				
Shingling,	Nos. 1 2 3	℘ doz	$7.25	$8.00	$8.75
Claw,	Nos. 1 2 3	℘ doz	7.75	8.50	9.25
Lathing,	Nos. 1 2 3	℘ doz	12.00	11.00	13.00

M. H. Jones & Co ... dis 25 %

	Nos.				
Shingling,	Nos. 1 2 3	℘ doz	$8.00	$8.50	$9.00
Half Hatchets,	Nos. 1 2 3	℘ doz	8.00	8.50	9.00
Claw,	Nos. 1 2 3	℘ doz	9.00	9.50	10.00
Lathing,	Nos. 1 2 3	℘ doz	8.00	8.50	9.00
Broad,	Nos. 2 3 4	℘ doz	11.00	13.00	14.50
"	Nos. 5 6 7	℘ doz	16.50	18.00	19.50

Empire Hatchets, M. H. Jones & Co ... net

	Nos.				
Shingling,	Nos. 1 2 3	℘ doz	$4.75	$5.00	$5.25
Lath	Nos. 1 2 3	℘ doz	4.75	5.00	5.25
Half Hatchets,	Nos. 1 2 3	℘ doz	4.75	5.00	5.25
All pol. Sh'gling,	Nos. 1 2 3	℘ doz	5.25	5.50	5.75
Solid Steel Lath,	Nos. 1 2 3	℘ doz	7.25	8.50	7.75

Hay Knives.
"Lightning" ... ℘ doz $20.00 net
Wadsworth's ... dis 30 %

Hinges.
Gate, Western ... ℘ doz $6.25, dis 60&10 %
" N. E ... ℘ doz $10.13, dis 60&10 %
" N. Y. State ... ℘ doz $7.20, dis 60&10&10 %
" Clark's No. 1 ... ℘ doz $6.00, dis 45 %
Rolled Plate ... dis 60&10 %
Rolled Raised ... dis 60&10 %
Wrought Strap and T ... dis 60 %
Providence Plate { 6 to 10 in. 11c ℘ ℔ / over 10 in. 9½c ℘ ℔ } .. dis 40&10 %
Screw Hook and Strap ... { 8, 10, 12 in., 11c / 14 to 36 in., 9½c } dis 40&10 %
Heavy Welded Hook ... { 8 to 12 in., 11 c / 14 in. & up, 9½c } .. dis 30 %
Screw Hook and Eye ... { ⅝ to 1 in., 11 c / ½ in. 12½c / ⅜ in. 13 c } ... net

Hoes.
Solid Shank, C. S ... ℘ doz $8.00, dis 40 %
Socket ... ℘ doz 9.00, dis 40 %
Riveted Eye ... ℘ doz 4.75, dis 40 %
Grub ... dis 30 %
Planters' ... dis 20 @ 25&10 %
Scovill Pattern ... dis 20 @ 30 %
Lane's C. S. Crescent Planters, Amer. Pat'n .. dis 20&5 %
" Scovill Pattern ... dis 20 %
Handled Solid C. S. Shank ... dis 35 %
Planters', Handled ... dis 35 %
Scovill Pattern, Handled ... dis 35 %

Hooks.
Bird Cage, Sargent's list ... dis 60&10 %
Cotton ... dis 50 %
Belt ... dis 60&10 %
Bench—Hotchkiss', $5.00 ℘ doz ... dis 10 %
" Weston's, No. 1, $8.00; No. 2, $7.00 ℘ doz ... net
" McGill's, $3.00 ℘ doz ... dis 10 %
" Skinner's, $6.25 per doz ... dis 20 %
Clothes Line, Hart's list ... dis 60&10&5&10 %
" " Sargent's list ... dis 60&10&10 %
" " Reading list ... dis 33⅓&5&10 %
Ceiling .. { Hart's list ... dis 70&10 %
Harness. { Sargent's list ... dis 60&5&10 %
{ Reading list ... dis 40&10 %
Coat and Hat, Hart's list ... dis 65&5&10 %
" " Sargent's list ... dis 60&10&10 %
" " Reading ... dis 40&10 %
Wrought Staples and Hooks and Staples ... dis 75 %
" Staples, Stanley's list ... dis 40 %
Wire Screw Hooks and Eyes ... dis 70&5&10 %
Grass ... dis 30 %
Whiffletree—Patent ... dis 40 %
Hooks and Eyes—Malleable Iron ... dis 60&10&10 %
" " Brass ... dis 60&10&10 %

Horse Nails ... dis 20 %

		Nos. 5	6	7	8	9	10
Ausable	℘ ℔	30c	27c	25c	24c	23c	22c
" P't'd and Pol'd.	"	31c	28c	26c	25c	24c	23c
" " and Blued	"	31c	28c	26c	25c	24c	23c
Cortland	"	29c	26c	24c	23c	22c	21c
" P't'd & Blued.	"	31c	28c	26c	25c	24c	23c
Buffalo Forged	"	31c	28c	26c	25c	24c	23c
Globe, P't'd and Pol'd	"	31c	28c	26c	25c	24c	23c
National, Pointed and Polished, Pat. Fin	"	28c	25c	23c	22c	21c	20c
National, Pointed and Polished, Ex. Fin	"	30c	27c	25c	24c	23c	22c
Perkins' P't'd—Black	"	26c	23c	21c	20c	19c	18c
Perkins' Pointed and Polished	"	27c	24c	22c	21c	20c	19c
Perkins' Pointed and Blued	"	27c	24c	22c	21c	20c	19c
Putnam Hammer, P't'd	"	32c	28c	26c	25c	24c	23c
Vulcan P't'd & Blued	"	31c	28c	26c	25c	24c	23c
North Western Plain	"	30c	27c	25c	24c	23c	22c
" " Fini'h'd	"	31c	28c	26c	25c	24c	23c

Horse Shoes.
Burden ... ℘ keg $4.02½
R. I. Horse Shoe Co., Perkins' Improved Light, Medium and Heavy ... ℘ keg 4.02½
Mule Shoes ... ℘ keg 5.02½
Perkins' Snow ... ℘ keg 5.02½
The Boston Horse Shoe ... ℘ keg 5.00

Ice Awls, Chisels, &c.
American Ice Chisel ... ℘ doz $6.50 net
National " ... ℘ doz $6.50, dis 10 %
Novelty Ice Breakers ... ℘ doz $6.50 net
White's Sliding Head Picks ... ℘ doz $2.50, dis 25 %
Dunlap's Ring Picks ... ℘ doz 3.00, dis 20 %
Wood Head Picks, Sargent's ... ℘ doz $1.85, dis 60&10 %
Iron " ... ℘ doz 1.85, dis 60&10 %
Ice Mallets, Pick in Head ... ℘ doz $1.75 net
" Pick in Handle ... ℘ doz 3.00 net
Ice Axes, Small, Cast or Malleable ... ℘ doz 1.50 net
Kitchen Ice Tongs ... ℘ doz 2.25 net

Kettles.
Brass ... ℘ ℔ 45c net
Enameled ... dis 55 %

Knives.
Ames' Butcher Knives ... dis 20 %
" Shoe " ... dis 15 %
" Bread " ... ℘ doz $1.50, dis 15 %
Hay and Straw—"Wadsworth's" ... dis 30 %
Table and Pocket ... See Cutlery

Knobs.
Carriage (Jap'd 80c. ℘ gross) ... dis 60&10 %
Base—Common ... dis 30&10 %
" Plush Tip ... dis 10 %
" Elastic End, No. 8 ... dis 60&5 %
Door, Mineral ... }
" Por. Jap'd ... } Same discounts as Door Locks.
" " Plated ... }
" Por ... }
Furniture, Plain ... 75c gross inch, dis 10 %
" Wood Screws ... dis 20 %

Ladles.
Melting—Hart's ... dis 55&10 %
" Sargent's ... dis 50&10 %
" Reading ... dis 15&10 %
" Monroe's Patent ... ℘ doz $4.00, dis 20 %

Lanterns.
Tubular ... No. 0, $10.00; No. 1, $12.50 } net
With Guards, 50c extra. }
Peerless ... No. 5, ℘ doz $11.75, dis 10&10 %
Brady's Patent ... dis 10&10 %
Ætna ... dis 10&10 %
Yankee ... dis 10&10 %
De Beque ... dis 10&10 %
Police ... Small, $7.50; Large, $9.00, dis 5 %

Lard Presses.
Draw Cut, 14 inch ... each $65.00, dis 20 %
Enterprise Mfg. Co ... dis 20 %

Lemon Squeezers.
Porcelain Lined ... ℘ doz $6.00 net
Eureka, Tinned ... ℘ doz $10.00, dis 10 %
Dunlap's Improved ... ℘ doz $6.00 net
Sammis' Patent ... No. 1, $7.50; No. 2, $12.00 ℘ doz ... dis 25&10

Lines.
Linen Fish ... dis 20 %
Cotton Chalk ... dis 50 %
Sil. Lake Chalk ... Nos. 0, 1, 2, 3, $6.00, $6.50, $7.00, $7.50 ... dis 20 %
Mason's ... dis 20 %
Wire Clothes, Gal'd ... each 50c net

Locks and Latches.
Cabinet—Gaylord } ... dis 25&2 %
" Eagle ... }
Trunk ... dis 25 %
Langstroth & Crane's List Jan. 1, '77.
Round Key ... dis 40&10 %
Flat Key ... dis 33⅓&10 %
Barnes & Deitz, Flat Key ... dis 25&30 %
Yale Lock Co., Flat Key ... dis 40 %
Sargent & Greenleaf, Flat Key ... dis 35&40 %
Continental ... dis 25 %
Shepardson's, Flat Key ... dis 35 %
American Lock Mfg. Co ... dis 33⅓ %
Plate ... dis 33⅓&2 %

DOOR LOCKS, &C.
Branford ... dis 60&10&2 %
Norwalk ... dis 50&10&2 %
Russell & Erwin ... dis 60&10&2 %
Mallory, Wheeler & Co ... dis 35&10&2 %
Padlocks—Russell & Erwin ... } ... dis 33⅓&5 %
" Mallory, Wheeler & Co ... } and 2 % for cash
" Wm. Wilcox & Co ... }
" American Lock Mfg. Co ... dis 33⅓ %
" Romer's ... dis 20 %
" Vulcan Hardware Co ... dis 20 %
" New York Lock Co ... dis 20 %
" J. H. McWilliams ... dis 10 %
" Barnes & Dietz ... dis 30 %
" Miller's Patent ... dis 40 %
" Penn Lock Works ... dis 33⅓ %
" " " (Scandinavian) ... dis 50 %

Mallets.—Hickory and Lignumvitæ ... dis 20 %

Meat Cutters.

Dixon's (P. S. & W.) Nos.	1	2	3	4	
℘ doz..	$14.00	17.00	19.00	30.00	—dis 25 %

Miles' Challenge ... Nos.	1	2	3	
℘ doz..	$22.00	30.00	40.00	—dis 30 %

Perry's Nos.	1	2	3	4	4 g'rd	5 g'rd	
Each..	$3.00	4.00	5.00	11.00	13.00	36.00	—dis 20&10 %

Woodruff's (P. S. & W.) ... Nos.	100	150	
℘ doz..	$15.00	18.00	—dis 20&10 %

Hales' ... Nos.	11	12	13	
℘ doz..	$33.00	40.00	51.00	—dis 50&2 %

Draw Cut ... Nos.	5	2	6	8	10	
Each..	$50.00	75.00	80.00	225.00	400.00	—dis 20 %

American ... dis 25 %

Nos.	1	2	3	4	B	5
Each	$5.00	7.00	10.00	25.00	50.00	60.00

Molasses Gates.
Stebbins' Pattern ... dis 62½&10 %
" Genuine ... dis 60&10 %
" Tinned Ends ... dis 40&10 %
Bush's ... dis 20 %
Lincoln's Genuine ... dis 62&10 %
Weed's ... dis 15 %

Mortars and Pestles.
Iron ... net
Mortising Machines ... each $20.00, dis 20 %

Nail Pullers.
Taft's ... ℘ doz $24.00 net
Nails ... See Trade Report
Nuts and Washers.
Square and Hexagon, new List March 1, '76. 7½c off list

Oakum.
Best ... ℘ ℔ 10½c
U. S. Navy ... ℘ ℔ 9½c
Navy ... ℘ ℔ 8½c

Oilers.
Zinc and Tin ... new list, dis 45 %
Brass and Copper ... new list, dis 40 %
Olmsted's ... dis 40 %
Broughton's ... dis 40 %
Malleable ... ℘ doz $5.00, dis 10 %
Prior's Patent or "Paragon" ... dis 45 %

Ox Balls ... dis 60&10 %

Pencils.
Faber's Carpenters' ... net
" Round Gilt ... ℘ gross $6.00 net
Dixon's Lead ... ℘ gross 4.50 net
" Lumber ... ℘ gross 9.00 net

Picture Nails and Knobs.
Brass Head, Sargent's List ... dis 60&10 %
Porcelain Head " ... dis 60&10&10 %
Pinking Irons ... ℘ doz $2.75, dis 65&10 %
Plaiting Machines.
Astor Plaiting Machine ... each $15.00, dis 20 %

Planes and Plane Irons.
First Quality ... dis 35@33&10 %
Second " ... dis 50&10 %
Bailey's Patent Adjustable, new list Jan. '77, dis 25&10 %
Bailey's "Victor" " " dis 25&10 %
Defiance Adjustable, new list ... dis 25&10 %
D. R. Barton Tool Co ... dis 20 %
Sandusky ... dis 35 %
Ohio Tool Co ... dis 35 %
Plane Irons, Butcher's ... $5.50 to £ gold
" Buck Bros ... $5.25 to £ gold
" Bailey's Patent ... dis 25&10 %
" Auburn Tool Co.'s ... dis 25 %
" Greenfield Tool Co ... net list
" Defiance ... new list dis 25&10 %
" D. R. Barton Tool Co ... dis 20 %
" Middletown Tool Co ... dis 10 %
" Ohio Tool Co ... dis 10 %
" Spear & Jackson's ... $5.00 to £ gold
" Sandusky Tool Co ... dis 10 %
Plow Bits, Greenfield Tool Co ... dis 10 %

Pliers and Nippers.
Button's Patent ... dis 33⅓ %
Hull's Patent Nippers, No. 1, $15; No. 2, $21 ℘ doz, dis 25 %
Gas Pliers ... dis 25 %
Eureka Pliers and Nippers ... dis 25 %

Plumbs and Levels.
Stanley R. & L. Co.'s Pat. Adjustable ... dis 60&10 %
" " " Non-Adjustable ... dis 60&10 %
Chapin's ... dis 60&10 %
Standard Rule Co.'s New Adjustable ... dis 60&10 %
" " Non-Adjustable ... dis 60&10 %
Johnson's Patent Adjustable ... dis 60&10 %
Davis' Patent ... dis 60&10 %
Pocket Levels ... dis 60&10 %

Post Hole and Tree Augers.
Eureka Digger ... ℘ doz $40.00, dis 20 %
Fletcher Post Hole Augers ... ℘ doz 36.00, dis 20 %
Vaughan's Post Hole—
6 in. $23.60; 7, 8 and 9 in. $25 per doz ... dis 20 %
Leed's ... $5.00 each, dis 35 %

Potato Parers, &c.
Bay State ... ℘ doz $12.00 net
"Saratoga" Peeler and Slicer ... ℘ doz 9.00 net

Pulleys.
Judd's Axle ... ℘ doz $0.75, dis 40 %
Hot House and Tackle ... dis 60&10 %
Jap'd Screw ... dis 60&10 %
Brass Screw ... dis 60&10 %
Jap'd Side ... dis 60&10 %
" Clothes Line ... dis 60&10 %
Hay Fork ... ℘ doz $4.50 @ 5.00, dis 10 %

Pumps.
Douglas Cistern, etc ... new list dis
" S. & F ... new list dis
Union Mfg. Co.'s Cistern and Pitcher ... dis 35 %
" " " Rams ... dis 25 %
" " " Garden Engines ... dis 20 %

Punches.
Belt or Drive ... ℘ doz $2.00; 2.25; 2.50, dis 30 %
Spring ... ℘ doz $6.50, dis 25&10 %
" Leach's Patent ... dis 15 %
" Bemis' ... dis 20 %

Rail.
Sliding Door, Wrought Brass ... ℘ ℔ 40c net
" " Iron, Painted .. ℘ foot 9c, dis 55&10 %
Barn Door, ½, ⅝ and ¾ inch ... dis 65&10 %
" for N. E. Hangers ... dis 65&10 %

Rakes.
Cast Steel ... dis 35 %

8	10	12	14 teeth.
$8.00	9.00	10.00	11.00

Malleable ... dis 40 %

9	10	11	12	13	15 teeth.
$5.00	5.50	5.50	6.00	6.00	6.50

Razor Straps.
Evans' ... dis 40 %
Imitation Emerson ... ℘ doz $2.75, dis 40&10 %
Hunt's ... dis 40&5 %
Chapman ... dis 10 @ 15 %
Torrey's ... dis 20 %
Saunder's ... dis 10 @ 15 %

Rivets.
Iron and Tinned ... dis 40 %
In bulk ... dis 30 %
Copper Rivets and Burs ... dis 10 %

Nos..	7	8	9	10	11	12	13	14	15
℘ ℔..	49c	50c	52c	54c	56c	58c	60c	65c	70c

Rivet Sets ... dis 20 %
Road and Levee Scrapers.
Doty's Revolving ... dis 25 %

Rods.
Stair ... dis 50 %
" American Patent ... dis 33⅓ %

Rollers.
Barn Door ... revised list dis 65&10 %
Novelty ... dis 10 %
Acme (Anti-Friction) ... dis 10 %

Rope. Manufacturers' List of Sept. 7, 1877.
Manila ... ½ inch and larger ℘ ℔ 14 c
" ... ⅜ inch ℘ ℔ 14½c
" ... ¼ and 5-16 inch ℘ ℔ 15 c
" Tar'd Rope ... ℘ ℔ 13½c
" " Lath Yarn ... ℘ ℔ 15 c
" Hay Rope ... ℘ ℔ 14 c
Sisal ... ½ inch and larger ℘ ℔ 11½c
" ... ⅜ inch ℘ ℔ 12 c
" ... ¼ and 5-16 inch ℘ ℔ 12½c
" Hay Rope ... ℘ ℔ 11½c

Rules.

	Boxwood.	Ivory.
Chapin's	dis 50&10 %	dis 40&10 %
Stanley	dis 50&10 %	dis 40&10 %
Standard	dis 50&10 %	dis 40&10 %
Stephens'	dis 50&10 %	dis 40&10 %
Willis, Thrall & Son	dis 50&10 %	dis 40&10 %

Sad Irons.
From 4 to 10 lbs ... ℘ ℔ 2⅜c net
Sad Iron, Nickel Stand attached ... ℘ ℔ 9c
Self-Heating ... ℘ doz $9.10 @ 9.25 net
" Tailors' ... ℘ doz $19.00 net
Mrs. Potts ... dis 20 %
Combined Fluter and Sad Iron .. per doz $15.00, dis 15 %

Sand Paper.
Baeder & Adamson's Flint, 00 to 1½ .. $4.25 ℘ ream }
" " " 2, 2½ & 3. 4.75 ℘ ream }
" " " Assorted 4.25 ℘ ream } dis 15 %
" " Star ... 3.25 ℘ ream }
" " Emery .. ℘ ream $6.50 @ 11.50 }
New England, same list as B. & A. Flint ... dis 15 %
H. B. & M. Roman Flint " " " ... dis 15&5 %

Sash Cord.
Common ... ℘ ℔ 16 @ 18c net
Patent ... ℘ ℔ 19c net
Silver Lake Russia Flax ... ℘ ℔ 55c net
" White Cotton ... ℘ ℔ 55c net
" Drab Cotton ... ℘ ℔ 60c net
Raw Hide ... dis 25 %

Sash Locks.
Clark's, No. 1, $10.00; No. 2, $8.00 per gross ... dis 40 %
Ferguson's ... dis 40 %
Norwich ... dis 25 %
Walker's ... dis 10 %
New England ... dis 20 %
Hammond's Window Springs ... dis 25 %
Northup Window Springs ... $9.00 per gross, dis 10 %

Sash Weights.—Solid Eyes ... ℘ ℔ 1½c

Sausage Stuffers or Fillers.
Miles ... ℘ doz $20, dis 30 %
Perry ... ℘ doz, No. 11, $15; No. 10, $21, dis 30 %
Draw Cut No. 4 ... each $30.00, dis 20 %
Enterprise Mfg. Co ... dis 20 %
Silver's ... dis 25 %

Saw Frames ... per gross $18.00, dis 15&10 %
Saw Rods ... $10 list, dis 10&10 %

Saws.
Spear & Jackson's ... £3.50 to £ gold
Disston's Circular ... dis 25 %
" Mill ... dis 30 %
" Cross Cut ... dis 20 %
" Hand, Panel, Rip, &c ... dis 20 %
H. W. Peace's Circulars ... dis 25 %
" Mill, Gang and Mulay ... dis 25 %
" Cross Cut, Wood, Hand, &c ... dis 20 %
E. M. Boynton's Lightning, Cross Cuts ... dis 50&5 % }
" One-Man, all lengths ... dis 40&5 % }
" Buck Saws (X Bar) .. ℘ doz $15, dis 40&10 % } 5 % cash.
" Billet Webs ... ℘ doz $10, dis 40&5 % }
" Pruning ... dis 40 % }
Wheeler & Clemson Mfg. Co.'s Hand ... dis 15 %
" " Cross-Cut ... dis 30 %
Livingston's Butcher and Kitchen ... dis 20 @ 25 %
" Framed Wood—

Nos. ...	101	102	103	104	105
Per doz..	$10.00	8.75	10.00	7.50	6.25 net

Saw Sets.
Boynton's Patent ... dis 40 %
Stillman's Genuine ... ℘ doz $4.25 net
" Imitation ... ℘ doz $3.25, dis 25 %
Common Lever ... per doz $2.00, dis 25 %
Leach's ... No. 0, $8.00; No. 1, $15.00, dis 15 %
Nash's ... No. 1, $8.50; No. 2, $5.50, dis 20&10 %
Hammer, Hotchkiss ... $5.50, dis 10 %
" Bemis & Call's ... dis 20 %
" Aiken's Genuine ... $13.00, dis 33⅓&10 %
" " Imitation ... $7.00, dis 25&10 %
" Hart's Patent Lever ... dis 20 %

Scales.
Hatch, Counter ... ℘ doz $36, dis 35 %
" Tea ... ℘ doz $15, dis 40 @ 45 %
Union Platform ... $6.00, $7.00, dis 40 %
Turnbull's ... dis 20 @ 25 %
Brown's ... dis 25&5 %
Fairbanks' ... dis 20&5 %
Howe's ... dis 20&5 %
Chatillon's Grocers' ... dis 25 %
" Eureka ... dis 20 %
Universal Family ... dis 25 %
Favorite Family ... dis 25 %
Scale Beams, new list ... dis 25 %

Scrapers.
Box, 1 Handle ... ℘ doz $5.00, dis 10 %
" 2 " ... ℘ doz 6.00, dis 10 %
Defiance Box and Ship ... dis 25&10 %
Foot ... dis 60&10 %
Ship (common) ... per doz $3.00 net
" (Providence Tool Co ... dis 10 %

Screw Drivers.
Hart, Bliven & Mead, new list ... dis 45&10 %
Douglass Mfg. Co ... dis 35&10 %
" " No. 1 ... dis 30&10 %
Disston's ... dis 45 %
Stanley Rule & Level Co., No. 1 ... dis 35&10 %
" " " No. 2 ... dis 45&10 %

Screws.
Flat H'd Iron, list Sept. 1, '75, R. & E. Mfg. Co. dis 60&10 %
" " Am. Sc. Co ... dis 60&10 %
Round Head Iron " ... dis 50 %
Flat Head Brass, list Sept. 1, '75, Am. Sc. Co ... dis 55 %
Round Head Brass, list Sept. 1, '75, Am. Sc. Co .. dis 40 %
Brass and Silver Capped, list March 1, '75 ... dis 40 %
Lag or Common Coach, new list Mch. 1, '76. dis 65 @ 70 %
Coach, Patent Gimlet Point, list Jan. 1, '75. dis 40 @ 50 %
Bed ... dis 10 %
Japanned, list of Plain Screws ... dis 45

Machine, Flat Head, Iron, Am. Screw Co........dis 10 %
" Round Head, Iron, " " ....net
Nettlefold's Brass..........................dis 60 @ 60&5 %
Bench, Iron....................................dis 60&10&10 %
" Wood, Beach.....................₩ doz $3.00, net
" " Hickory.............................dis 20&10 %
Hand..dis 25&10 %
Hand Rail, Sargent's...............................dis 55&10 %
" " Humason, Beckley & Co.'s........dis 40&5 %
Jack, Bell Bottom......................................dis 15 %

Scythes.

Blood's German Steel, Grass.....₩ doz $10.00 } dis $1.50 from list
" Cast, " " .....₩ doz 11.00
" Silver " " .....₩ doz 12.00
" German " Grain.....₩ doz 14.00
" Cast " " .....₩ doz 15.00
" Excelsior and Granger..₩ doz 11.00 } dis $1.50 from list
" Young America.............. 10.50
" Silver Clipper.................. 13.00
Wadsworth's Grass.....................................dis 30 %
" Bush.....................................dis 20 %
Scythe Snaths...dis 20 %

Shears and Scissors.

Cast Steel...dis 75 & 10 %
" Iron..dis 55 %
Seymour's Straight Trimmers..........................dis 65 %
" Scissors..dis 50 %
Pruning...............................₩ doz $5.50 @ $6.00, net
Barnard's Lamp Trimmers...........................₩ doz $3.75

Sheaves.

Sliding Door, M. W. & Co., list.................dis 35&10&2 %
" R. & E. list.......................dis 50&2 %
" Patent Roller.....................dis 25&20 %
" " " Hatfield's..................dis 50&2 %
" Russell's Anti-Friction ....dis 50&2 %
Sliding Shutter, R. & E. list........................dis 50 %
" " Sargent's list......................dis 55&10 %
Moore's Anti-Friction..................................dis 33⅓ %

Shovels and Spades.

Ames..dis 30 %
Rowland's...dis 50 %
Kimball Shovel Co......................dis 20 @ 20&5 %
Old Colony...dis 30 %
Middleboro' Shovel Co.................................dis 30 %
Remington's (Lowman's Patent)......................dis 30 %
Dunning's Shovels and Scoops....................dis 20&7½ %

Shovels and Tongs.

Iron and Brass Head, R. & E. list.................dis 50&2 %
" " Hart's......................dis 55&10 %
Polished Steel...dis 50&2 %

Slates.

Square Frames, Round Cornered, by case.......dis 70 %
Less than a case.................................dis 65&10 %

Spokes.

North Carolina Handle Co..............................dis 20 %

Spoke Shaves.

Defiance Metallic......................new list, dis 25&10 %
Iron...dis 33⅓&10 %
Wood...dis 30 %
Bailey's..dis 25&10 %

Spoke Trimmers.

Bonney's..............................₩ doz $10.00, dis 40 %
Stearn's..............................₩ doz $10.00, dis 40 %
Ive's...... No. 1, $15.00; No. 2, $12.00 ₩ doz, dis 33⅓&10 %
Douglass'..............................₩ doz $9.00, dis 25&10 %

Spoons.

Tinned Iron..dis 10 %
By the case..dis 20 %
Basting...dis 10 %
Britannia...dis 55 @ 60 %
" Boardman's.......................................dis 55 %
Derby Silver Co.......................................dis 40&5 %
Rogers & Bro., A 1......................................dis 40 %
Reed & Barton..dis 40&5 %
Rogers Cutlery Co..................................dis 40&5&5 %
Hall & Elton..dis 40&5 %
Holmes, Booth & Haydens............................dis 40&5 %
German Silver (Hall & Elton)..........................dis 25 %
Tin (P. S. & W.), Teas.......................$1.50 ₩ gross, net
" " Tables......................$2.50 ₩ gross, net
Tin (Cowles Hdw. Co.)..................................dis 10 %
" " " case lots.............................dis 20 %

Stocks and Dies..dis 5&10 %

Stone.

Hindostan Stone..........................₩ ℔ 6c } dis 25&10 %
" Ax Stone..........................₩ ℔ 8c
" Slips................................₩ ℔ 10c
Sand Stone................................₩ ℔ 6c, dis 25&10 %
Washita Stone...........................No. 1, ₩ ℔ 30c, net
" ....No. 2, ₩ ℔ 25c, net
" Slips.........................No. 1, ₩ ℔ 60c, net
Arkansas Stone..........................No. 1, ₩ ℔ $1.35, net
" Slips.............................No. 1 ₩ ℔ $2.50, net
Grindstones, Family, Loring's...........................dis 10 %

Stove Polish.

Joseph Dixon's...........................₩ gross $6.00, dis 5 %
Gem...₩ gross $4.50, dis 5 %
Gold Medal................................₩ gross $6.00, dis 25 %
Rising Sun....................................₩ gross $5.75, net

Squares.

Steel.........................dis 50 %; full cases, dis 50&10 %
Iron..........................dis 50 %; full cases, dis 50&10 %
Nickel Plated...................add $2.50 @ $4.00 ₩ doz, net
Try Squares and T Bevels.............................dis 45&10 %
Star Try Squares and Bevels...........................dis 35 %
Disston's Try Squares No. 1...............................dis 30 %
" " No. 2...............................dis 45 %
" " Improved, Nos. 1 and 2...dis 30 %
Winterbottom's Try and Miter.......................dis 20&10 %

Tacks, Brads, &c.—List of January 1, 1876.

Tacks, Half Weight, American.dis 75&20 } dis 10 % for cash
" Full " ...dis 50&20
" Half " Swedes.....dis 65&20
" Full " " .....dis 30&20
" Carpet, Am. and Swedes..dis 20&20
" " Leather Head.........dis 20
" Copper.......................52c, dis 20
Brads, Half Weight.................dis 50&20
Shoe Nails—
4-8ths and longer, 9c; 3½-8ths, 9½c ₩ ℔, dis 20&10 %
Trunk, Clout and Finishing Nails—

½	⅝	¾	⅞	1	1⅛ in. and over.
25	20	17	15	13	11c ₩ ℔, dis 20&10 %

Double-Pointed Tacks................................dis 40&5 %

Tap Borers.

Common and Ring.....................................dis 25&10 %
Ives' Tap Borers.......................................dis 10&10 %
Enterprise Mfg. Co.......................................dis 20 %

Tapes, Measuring.

American Flask and Cap Co............................dis 20 %
Eddy's...dis 20 %

Tea Trays.

American Tea Tray Co....................................dis 15 %

Thermometers.

Tin Case...dis 60&5&10 %

Tobacco Cutters.

Enterprise Mfg. Co. (Champion).........................dis 20 %
Wood Bottom.......................₩ doz $12.00, dis 30&10 %
All Iron..............................₩ doz $10.50, dis 40&5 %
Nashua Lock Co.'s..........................₩ doz $18.00, dis 50 %

Toe Calks.

Winsted..................................₩ ℔ 10c. dis 5 @ 7½ %

Tinners' Tools and Machines.

P. S. & W..dis 10 %

Traps.

Game, Newhouse...dis 30 %
" Newhouse Pattern.................................dis 60 %
" Blake's Patent......................................dis 40 %
Mouse, Wood, Choker......................₩ doz holes, 15 @ 16c
" Patent Choker (Union Nut Co)..............₩ doz holes, 16 @ 18c, net
" Round Wire.........................₩ doz $1.50, dis 1
" Square " ....₩ doz $2.00 to $2.50, net
" Cage " ....₩ doz $2.50, dis 10 %
" Patent Self Setting.................₩ doz holes, 25c, net
" Catch-em-alive...............................₩ doz $4.00, net

Trowels.

Lothrops Brick and Plastering...........................dis 10 %
Disston's Brick and Plastering..........................dis 20 %
Peace's Plastering...dis 20 %
Clement & Maynard's......................................dis 20 %
Rose's Brick...dis 5 %
Brades' Brick...gold, dis 20 %
Worrall's Brick and Plastering..........................dis 20 %
Garden...dis 25 %

Triers.

Butter and Cheese..dis 25 %

Ventilators, Window.

Nickel and Gilt...........................₩ doz $16.00 @ $18.00

Vises.

Solid Box, Trenton......................40 to 160 lbs., 12½c, net
" Wilson's........ { 30 to 160 lbs., 18c, 160 and over, 22c, } dis 33⅓ %
" Peter Wrights.......................................15½c, gold
Parallel, Parker's..dis 20 %
" Wilson's..dis 30&10 %
" Sargent's...dis 55&10 %
" Trenton..dis 25 %
" Backus and Union.................................dis 25 %
" Merrill's..dis 15 %
" Fisher & Norris....................................dis 15&10 %
" Buffalo..dis 25 %
" Stevens'...dis 25 %
" Simpson's Adjustable..............................dis 25 %
Saw Filers, Bonney's.......................₩ doz $20.00, dis 25 %
" Stearn's.........................₩ doz $20.00, dis 25 %
" Hopkins'........................₩ doz $17.50, dis 10 %

Wheel Barrows.

Canal (Pugsley & Chapman ......new list, dis 30 %
Coal, Garden and Stone (Pugsley & Chapman)..dis 30 %
Jacob's Pat. Self-Oiling R. R. and Canal..........dis 25 %

Well Wheels.—Revised list.........................dis 60&10 %

Wire.

Brass and Copper..............List of Jan. 1, 1877, dis 10 %
Bright and Annealed.........Nos. 0 @ 18, dis 55 @ 57½ %
" " ....Nos. 19 @ 26, dis 60 @ 62½ %
" " ....Nos. 27 @ 36, dis 62½ @ 65 %
Coppered.....................Nos. 0 @ 18, dis 52½ @ 55 %
Galvanized, Nos. 0 to 6......................₩ ℔ 10c, dis 30 @ 35 %
" Nos. 7 to 18........market list, dis 30 @ 35 %
Tinned, Nos. 0 to 18..................................dis 35 @ 40 %
Cast Steel...dis 20 @ 25 %
Tinned Broom Wire, Nos. 18 to 25.........dis 42½ @ 45 %
Galvanized Telegraph, Nos. 7 to 9.........................₩ ℔ 9c
" " Nos. 10 and 11.............₩ ℔ 10c
" " No. 12.......................₩ ℔ 10½c
Annealed Fence, Nos. 8 and 9...............dis 57½ @ 60 %
" Grape, Nos. 10 to 14.........................dis 57½ %
Fence Staples...₩ ℔ 7 @ 7½c
Fence Staples, Galvanized.........................₩ ℔ 9½ @ 10c
Stubs Steel Wire.....................................$7.00 to £ gold
Japanned Barb Fence.......................................₩ ℔ 15c
Galvanized " ....₩ ℔ 18c
Steel Music Wire, Nos. 12 to 27..............................₩ ℔ 10c
Judd's Picture Wire...dis 50 %
Clothes Line Wire, Galvanized......₩ coil 43 @ 50c, net

Wrenches.

American Adjustable.......................................dis 45 %
Baxter's Adjustable "S," New list May 1, '76....dis 20 %
" Diagonal, " " ....dis 20 %
Collins & Co.'s..dis 45 %
Coes' Genuine...dis 50&5 %
" Pattern (Wrought)...............................dis 50&10 %
" " (Malleable)..............................dis 75&10 %

Girard...dis 50&10 %
Hull & Belden's "Climax".................................dis 25 %
Knight's Patent..dis 25 %
Lindsay's " ....dis 25 %
Taft's Pattern...dis 75&10 %
Davis' Patent Duplex.........................new list, dis 25 %
Bemis & Call's Patent Combination................dis 20&5 %
" " Merrick's Pattern.................dis 25&2½ %
" " Briggs' Patent.......................dis 20&5 %
Aiken Pocket (Bright)...........................$8.00, dis 40 %

Wringers. Per doz.

Universal, without Cog Wheels.............................$54.00
" with Cog Wh'ls, No. 2½, small fam'y size 63.00
" " " No. 2, usual " .. 66.00
Crown No. 2.. 54.00
" No. 2½... 60.00
" No. 3... 66.00
Climax No. 2..................$71.00 } Less $2.00 ₩ doz. for cash before shipment.
" No. 1½.......................79.00
XXX Universal No. 2.........71.00
" " No. 1½......79.00
Household, no Cog Wheels................................. 54.00
Sherman, with " 63.00
Eureka, no " 60.00
Reliance, with " 63.00
Novelty, No. 10, with Cog Wheels......................... 63.00
" No. 2, " " 66.00
" No. 22, " " 70.00
Excelsior, No. A, with Folding Bench..................... 84.00
" No. E, for Set Tubs............................ 72.00
Keystone No. 1, Wood Frame, no Gear.................... 50.00
" No. 2, Iron " 48.00
" No. 2½, Wood " Purchase Gear..... 60.00
" No. 10, Wood " Common Gear...... 57.00
Peerless, No. 2.. 66.00
" No. 3.. 74.00

Stamped Tinware.

Common Stamped Ware..................................dis 35 %
Stamped Deep and Retinned Ware....................dis 45 %

METALS.

IRON.—Duty: Bars, 1 to 1½c. ₩ ℔; Sheet, Band Hoop and Scroll, 1¼ to 1¾c. ₩ ℔; provided, that none of the above Iron shall pay a less rate of duty than 35 per cent. Pig, $7 ₩ ton; Polished Sheet, 3c. ₩ ℔; Wrought Scrap, $8 ₩ ton; Cast Scrap, $6 per ton. Railroad, 70c. ₩ 100 ℔s. Boiler and Plate, 1½c. ₩ ℔.

Pig Iron—American.

Foundry No. 1..........................₩ ton $18.00 @ 19.00
" No. 2..........................₩ ton 17.00 @ 18.00
Gray Forge..................................₩ ton 16.00 @ 17.00

SCOTCH.

Glengarnock...............................₩ ton 25.00 @ 25.50
Eglinton....................................₩ ton 24.00 @ 24.50
Coltness....................................₩ ton 26.50 @ 27.00

Rails.

Iron, at mill...............................₩ ton $33.00 @ 38.00
Steel, " ....₩ ton 45.00 @ 47.00
Old Rails...................................₩ ton 19.00 @ —

Scrap.

Wrought Scrap, from yard.............₩ ton 22.00 @ 23.00

Bar Iron.

American Refined. 2c

Bar Iron, from Store.

Common Iron:
¾ to 2 in. round and square.............. } ₩ ℔ 1 9c
1 to 6 in.x⅜ to 1 in.......................
Refined Iron:
¾ to 2 in. round and square.............. } ₩ ℔ 2 @ 2.c
1 to 6 in.x⅜ to 1 in.......................
1 to 6 in.x¾ and 5-16.................₩ ℔ 2.2 @ 2.3c
Rods—⅝ and 11-16 round and square.....₩ ℔ 2.1 @ 2.2c
Bands—1 to 6x12 to 3-16..............₩ ℔ 2.5 @ 2.6c
Swedish Iron:
Ordinary sizes...5c

Sheet Iron.

	Common American.	R. G. American.
Nos. 10 to 20	₩ ℔ 3 c	4 @ 4¼c
21 to 24	₩ ℔ 3¼c	4 @ 4¼c
25 to 26	₩ ℔ 3½c	4¼ @ 4½c
27	₩ ℔ 3¾c	4¼ @ 4½c
28	₩ ℔ 4 c	5c

Galvanized, 14 to 20, prime,	₩ ℔ 7½c;	2d qual,	₩ ℔ 6 c
" 21 to 24, "	₩ ℔ 8 c;	"	₩ ℔ 6½c
" 25 to 26, "	₩ ℔ 8½c;	"	₩ ℔ 7 c
" 27 "	₩ ℔ 9 c;	"	₩ ℔ 7½c
" 28 "	₩ ℔ 9½c;	"	₩ ℔ 8 c

Patent Planished..........................₩ ℔ A, 11c; B, 9½c
Russia, Nos. 8 to 26...........................₩ ℔ 11½ @ 12c
American Cold Rolled..................................₩ ℔ 4½c

COPPER.—Duty: Pig, Bar and Ingot, 5c; Old Copper, 4c ₩ ℔; Manufactured (including all articles of which Copper is a component of chief value), 45 % ad valorem.

American Ingot...................................₩ ℔ 19 @ 19¼c
English " ....₩ ℔

SHEATHING, BRAZIERS' COPPER, BOLTS, &C.

Braziers' Copper, ordinary sizes, over 16 oz., ₩ sq. ft...₩ ℔ 30c
Braziers' Copper, ordinary sizes, 16 oz. and over 12 oz., ₩ sq. ft..............................₩ ℔ 32c
Braziers' Copper, 12 oz., ₩ sq. ft.......................₩ ℔ 34c
Circles less than 84 in. in diameter..................₩ ℔ 33c
Circles 84 in. diameter and over.......................₩ ℔ 36c
Segment and Pattern Sheets...........................₩ ℔ 33c
Locomotive Fire Box Sheets............................₩ ℔ 30c
Sheathing Copper, over 12 oz. ₩ sq. ft................₩ ℔ 28c
Bolt Copper...₩ ℔ 30c
Copper Bottoms.......................................₩ ℔ 30c net
No Copper is Sheathing except 14x48 inches, and not to exceed 34 oz. to the sq. ft.

TINNING.

14x48, by the case..₩ sheet 6c
14x48, less than case.......................................₩ sheet 8c
For tinning both sides, double the above amount.

O'NEILL'S PATENT PLANISHED COPPER.

14x48.
14 and 16 oz. and heavier..₩ ℔ 36c By the case.₩ ℔ 35c
12 oz. and lighter..........₩ ℔ 39c " " ..₩ ℔ 38c

Boiler Sizes.

7 in., 14x52. 8 in., 14x56. 9 in., 14x60.
14 and 16 oz. and heavier.₩ ℔ 38c By the case.₩ ℔ 35c
(And all sizes not over 20 in. wide.)
30x60.
14 and 16 oz. and heavier..................................₩ ℔ 40c
12 oz...₩ ℔ 43c

Brass.

Brown & Sharp's Gauge the Standard for Metal; Old English Gauge the Standard for Wire.

BRASS MANUFACTURERS' PRICE LIST.

January 1, 1877.

Cash prices for Roll and Sheet Brass. For less quantity than 100 ℔s. add 3c ₩ ℔.

HIGH BRASS.

All Nos. not thinner than to No. 28, wider than 2 in., not wider than 14 in..30c
All Nos. to No. 28, inclusive, and widths over 14 to 20 in., inclusive...34c
All Nos. to No. 28, inclusive, and widths over 20 to 30 in., inclusive...37c
½c. ₩ ℔ advance on each No. above Nos. 28 to 38, inclusive.
All Brass thinner than No. 38 is Platers' Brass, at...50c
Sheets 24x48, and all sheets cut to particular sizes and lengths under 30 in., in width wider than 2 in..37c
Printers' Rules...44c
Sheets wider than 30 in. and under 40 in..................45c
" " 40 in. and over.........................47c
Circular Sheets, in diam. from 4 in. to 14, inclusive..41c
" " over 14 " 20, " ..45c
" " " 20 " 30, " ..48c
" " " 30 " 40, " ..51c
" " " 40 in.............................54c

LOW BRASS.

4c ₩ ℔ more than High Brass.
Gilding Metal, 8c ₩ ℔ more than High Brass.
Platers' or Gold Metal { In Bars..........................46c
Sawed...........................49c
Planed or Polished.........52c }

FOR SLITTING.

Metal in width 2 in. to ½ in. to No. 28, inclusive, 1c. ₩ ℔ advance.
Metal, in width 2 in to 1 in., thinner than No. 28, 2c. ₩ ℔ advance.
Metal, in width 1 in. to ½ thinner than No. 28, 3c ₩ ℔ advance.
Metal, in width ½ in. to ¼, inclusive, not thinner than No. 28, 2c. ₩ ℔ advance.
Metal, in width ½ in. to ¼ thinner than No. 28, 5c. ₩ ℔ advance.
Metal, ¼ in. in width and less, 10c. ₩ ℔ advance.
Any of the above widths cut to particular lengths, add 7c. ₩ ℔.

GERMAN SILVER MARKET METAL AND WIRE.

	Market Metal.	Wire.
5 per cent., 12 ℔., to No. 26	$0.60	$0.85
6 " " "	.68	.95
10 " " "	.84	1.15
15 " " "	1.04	1.40
18 " " "	1.10	1.55

German Silver Sheets over 12 in. wide and weighing more than 16 ℔s., $2.25 ₩ ℔.
Advance 2c. for each additional inch in width above 12 in., and 2c. ₩ ℔ on each No. thinner than Nos. 26 to 36, inclusive.
All German Silver thinner than No. 36 is Platers, at 50c ₩ ℔ additional.
German Silver Scrap one-third less than net price of 12 in. Market Metal. German Silver Turnings, Filings and Chips, half the price of Scrap.

BRASS AND COPPER WIRE.

	High Brass.	Low Brass.	Gild'g and Copper.
No. 0 to 20	$0.34	$0.38	$0.45
No. 21	.35	.39	.46
No. 22	.36	.40	.47
No. 23	.37	.41	.48
No. 24	.39	.43	.50
No. 25	.42	.46	.53
No. 26	.44	.48	.55
No. 27	.46	.50	.57
No. 28	.49	.53	.60
No. 29	.52	.56	.63
No. 30	.55	.59	.69
No. 31	.59	.63	.75
No. 32	.63	.67	.81
Na. 33	.67	.71	.90
No. 34	.71	.75	1.00

Spring Wire 2c ₩ ℔ advance.
Flat, Square and Half Round Wire 5c ₩ ℔ advance on Round Wire.
Fancy Wire not less than 10c ₩ ℔ advance of Round Wire.
Brass Rods, No. 8 and smaller not less than 2 feet lengths, 45c.
Wire straightened and cut, smaller than No. 8, and not less than 2 feet lengths, 40c.
Wire and Rods less than 2 feet lengths, special rates.
Twelve cents per ℔ extra for spooling on 1 ℔ spools.

MISCELLANEOUS.

Common Plain Brass Pail Ears............................$0.44
Brass Door Rail...45

SCRAP.

High Brass Scrap..16c
Low " 18c
Gilding...20c
Turnings, Filings and Chips half the price of Scrap.
Terms—Net cash. Interest to be added after thirty days.

TUBING. ₩ ℔

Plain to No. 20 inclusive, above ¼ in. to 3 in.........$0.40
" above 3 in..50
Nos. 21, 22, 23, two cents advance on List for each Number.
Nos. 24, 25, 26, four cents advance on List for each Number.
Above No. 26, special rates.
Plain, ¼ inch...78
" 3-16 " 1.10
" ⅛ " 1.60
All Mandrel Drawn Tubes, 5 cents advance on List Prices.
Fancy Tubing to No. 20....................................
English, Scotch and Extra Patterns Fancy Tubing to No. 20...53
Tubing Sawed or Cut 2 to 4 feet long, 2 cents advance on List.
Add to 2 cents ½ cent for each additional cutting under 2 feet.
All Mandrel Drawn Tubes under ⅜ in., 25 cents per pound advance.

ZINC TUBING.

Plain...28
Fancy...31
Scotch and Extra Patterns..................................34

GERMAN SILVER TUBING.

4 Per cent..85
6 " 95
9 " 1.10
12 " 1.25
15 " 1.40
16 " 1.45
18 " 1.55
20 " 1.56

STEEL.—Duty: Bars, Ingots, Sheets and Coils, valued at 7 cents ₩ ℔., or under, 2¼ cents; over, 7 cents, and not above 11, 3 cents ₩ ℔; over 11, 3½ cents ₩ ℔, and 10 % ad val. Railway Bars, 1¼ cents ₩ ℔. Railway Bars, in part Steel, 1 cent ₩ ℔. Provided, that Metal cemented, cast or made from Iron by the Bessemer or pneumatic process, of whatever form or description, shall be classed as

American Cast Steel.

Tool...15c
Spring..7c
Homogeneous..12½c
Boiler Plate..8c
Tire...5½c
Machinery (round and square)...................................9c
File..9c
Sheet...11 @ 16c
Saw Plate, mill and mulay................................14 @ 16½c
" gang and X cut............................13 @ 14c
" circular as to size........................18 @ 30c

Chrome Steel.

Tool...₩ ℔ 18 @ 19c
Tool, extra fine....................................₩ ℔ 40 @ 75c
Spring...₩ ℔ 10 @ 11c
Machinery..₩ ℔ 10 @ 11c
Hammer..₩ ℔ 12 @ 13c
Gun or Homogeneous...............................₩ ℔ 14 @ 16c

English Steel.—Payable in gold, net.

" Best Cast.....................................₩ ℔ 17¾c
" Extra Cast....................................₩ ℔ 18¾c
" Round Machinery, Cast.......₩ ℔ 10¼ @ 11½c
" Swaged, Cast..................................₩ ℔ 19½c
" Best Double Shear..........................₩ ℔ 17¾c
" Blister, 1st quality...........................₩ ℔ 14½c
" " 2d quality.............................₩ ℔ 13c
German Steel, Best..................................₩ ℔ 11½c
" 2d quality...............................₩ ℔ 10½c
" 3d quality...............................₩ ℔ 9½c
Sheet Cast Steel, 1st quality......................₩ ℔ 17¾c
" " 2d quality......................₩ ℔ 14½c
" " 3d quality......................₩ ℔ 12½c
File Steel, Flat and ½ Round.......................₩ ℔ 12½c
" Square and Round.......................₩ ℔ 12½c
" Mill..₩ ℔ 13½c
" Taper to 4 inch............................₩ ℔ 16c
" Taper 3 and 3½ inch......................₩ ℔ 18c

ANTIMONY.....................................13c currency

LEAD.—Duty: Pig $2 ₩ 100 ℔s; old Lead, 1½c ₩ ℔; Pipe and Sheet, 2¾c ₩ ℔.

Spanish.......................................6⅝ @ 6¾c gold
German Refined...................................6¾c gold
English...6¾ @ 7c gold
American...................................5½ @ 6c currency
Bar..7c, dis 10 %
Pipe...7½c, dis 10 %
Tin Lined Pipe..................................15c, dis 10 %
Sheet..8c, dis 10 %
Shot........................Drop 8¾; Buck, 9¾c, dis 10 %

BABBITT METAL.

N. P. U..₩ ℔ 8½ @ 9c
A 25c; B, 20c; C, 15c; D, 12c ₩ ℔.

TIN.—Duty: Plates, Sheets, Tagger and Terne, 1.1c ₩ ℔; Electro-galvanized Plates, 2c ₩ ℔; Manufactures of, not enumerated, 35 per cent. ad. val. Bars, Block and Pigs free. Banca, subject to duty of 10 per cent.

Banca...............................₩ ℔ 19 @ 19½ currency
Straits.............................₩ ℔ 17 @ 17½ currency
English..................................₩ ℔ 17½ currency

TIN PLATES, CURRENCY PRICES

I C 10x14, 12x12, 14x20 } Prime Charcoal..........$7.25 @ 7.50
I X 10x14, 12x12, 40x20 } Prime Charcoal.......... 9.50 @ 9.75
D C 12½x17 " .... 6.75 @ 7.00
D X 12½x17 " .... 9.00 @ 9.25
For each additional X add.................................... 2.25

COKE TIN PLATE.

	Best.	2d quality.	Ordinary.
I C 10x14, I C 12x12, I C 14x20	$6.75	6.50	6.00 @ 6.25

TERNE PLATE.

	Prime Char.	2d qual.	Coke.
I C 14x20	$6.50 @ 6.62½	6.00 @ 6.37½	6.25 @ 6.00
I X 14x20	9.00 @ 8.75	....	....
I C 20x28	13.50 @ 14.00	13.00 @ 13.50	12.00 @ 13.00
I X 20x28	.... @ 18.50	....	....
I C 20x20	.... @ 21.00	....	....

I C 14x20 M. F. Brand...................................$7.50 @ 7.75

SOLDER........No. 1, 11½ @ 12½c; No. 2, 10¾ @ 11½c

SPELTER—Duty: In Pigs, Bars and Plates, $1 ₩ 100 ℔s.

Silesian, cash.....................................6¾ @ 7c gold
American, cash..6¼ @ 6½c
Lehigh, on spot...10c

ZINC.—Duty: Pig or Block, $1.50 ₩ 100 ℔s. Sheet, 2½c ₩ ℔.

Sheet..cask 7¾c
" 8c

Paper Stock, Old Metals, &c

(Dealer's Selling Price.)

Canvas linen...5¾ @
" cotton, No. 1.. @ 6½
" " No. 2.. @ 3½
White linen rags, No. 1..................................5½ @
" " No. 2..................................3½ @
Colored...2¼ @
Mixed woolens...2½ @ 3¼
Soft woolens...7 @
Gunny bagging..3⅜ @
Jute Butts..3 @ 3½
Kentucky bagging...5 @
Waste paper and scraps....................................1 @ 1½
Rope cuttings...1½ @ 3
Kentucky bale rope...4 @ 4½
Oakum junk, No. 1...5½ @ 5¾
" No. 2.. @ 4
Grass rope...3⅜ @
Tarred shaking..2 @
White collar cuttings, all paper..........................7 @
" " " muslin lined......................5 @
" " Envelope.......................................7 @
Hard White Shavings, No. 1..............................5½ @
Soft " " No. 1..............................4½ @ 4¾
White Shavings, No. 2.....................................4½ @ 4¾
Mixed Shavings, part white...............................3½ @ 4
Imperfections, No. 2, best folded sheets...............4½ @
" No. 1, Heavy Stock.........................4¼ @
Book Stock...3½ @ 3¾
" " Mixed...4½ @
" " No. 2, light......................................2 @
Newspaper Stock..2¾ @
Prints...1½ @ 2
Pure Manilas...2¾ @ 2⅞
Bogus Manilas and Hardwares.............................1 @
Commons..½ @
Binders' Board Cuttings.....................................1 @
Straw Board Cuttings...¾ @
Woolen Tailor Clips..13 @ 14
Satinet " ....2 @ 2½

Old Metal.

Copper..15 @ 16
Yellow Metal..13 @
Brass, light..9 @
" heavy...10½ @
Heavy Composition..13 @
Old Lead, solid..@ 4½
Tea Lead...@ 4¼
Zinc..@ 4¼
Pewter, No. 1..15 @
" No. 2...9 @ 10
Spelter..@ 6½
Wrought Iron...per ton $19.00
Machinery Iron..per ton 13.00
Light Iron..per ton 13.00
Stove Plate..per ton 10.50
Burnt Iron..per ton 5.00

Paints, Oils, &c.

Paints.

Black Lamp, Coach Painters............................₩ ℔ 20c
" " Ordinary...6c
" Ivory Drop, fair...15c
" " best...23c
Black Paint, in oil.............kegs, 8c asst'd cans, 11c
Blue, Prussian, fair to best................................40 @ 55c
" " " " in oil............................25 @ 55c
" Chinese dry...83c
" Ultramarine..18 @ 30c
Brown, Spanish...1¼c
" Van Dyke..9c
Carmine, 40.................................combination price
Green, Chrome..15 @ 23c
" " in oil...................................18 @ 25c
" Paris......................good, 30c; best, 40c
" " in oil...................... " 30c; " 45c
Mineral Paints..1¼ @ 4c
Orange Mineral..14c
Red Lead, American..8½c
" " English...10½c
" Venetian (N. C.) dry...2c
" " in oil.........asst'd cans, 11c; kegs, 8½c
" Indian dry...10c
Rose Pink...10 @ 13c
Sienna, American, Raw..4c
" Burnt...4½c
" " in oil....................................16 @ 20c
" Raw " ....15 @ 25c
Umber, Burnt...4 @ 8c
" " in oil....................................16 @ 21c
" Raw..3½ @ 7½c
" " in oil....................................16 @ 22c
Vermillion, Chinese..................................$1.00, gold
" English....................................72½c, gold
" Trieste.......................................1.10, gold
" American, Common...................................18c
White Lead, American, pure dry..............................9½c
" " " in oil......................................10c
White, Paris, English, prime.........in bbls. 2½ @ 2¾c
Yellow Ochre, French...$1.75
" " " in oil...asst'd cans, 11c; kegs, 8c
" " Vermont.....................in casks 1½c
Yellow Chrome...17 @ 27c
" " in oil...18 @ 28c
Zinc White, American No. 1, dry..................................9c
" " No. 1, in oil.......................................11
" French (Paris)..11
" " in oil...12

Oils.

Linseed, Raw..................₩ gal. casks, 60c. bbl, 61c
" Boiled...........................casks, 65c. bbl, 66c
Whale, Crude...bbl, —
" Bleached Winter.......................................bbl, 75c
Sperm, Crude...bbl, 1.60
" Winter unbleached.................................bbl, 1.65
" " bleached......................................bbl, 1.75
Seal, Extra Refined..bbl, —
Lard, Pure Winter...bbl, 80c
" Spring...bbl, 80c
Cotton Seed, Crude...bbl, 62c
" Southern Yellow...............................bbl, 67c
" White...bbl, —
Neatsfoot, Winter...................................70c @ $1.10
Natural Lubricating.....................................38c @ 40c

Sundries.

Asphaltum..9c
Benzine...₩ gal. 16c
Chalk..¾c
" Block..¾c
Dryer, Patent, Am'n...............asst'd cans, 10½c; keg, 9c
" " English......... " 11c; " 9c
Flocks..
Frostings..50c
Glue, White..33 @ 44c
" Sheet...20c
Glaziers' Points, Zinc...6c
Gum, Copal...36c
" Damar...25c
" Shellac, English...4 c
" " " dark..................................40c
Litharge..9½c
Pumice Stone, selected Lumps..................................4 @ 6c
" powdered.......................................2¾c
Putty, in bladders...2½c
" in bulk..2½c
Rotten Stone, soft, English...8c
Spirits Turpentine...36c
Whiting, Spanish..¾c

Glass.

FRENCH WINDOW GLASS.

Prices current per box of 50 feet.

Single Thick.—discount 60 %

SIZES.	1st.	2d.	3d.	4th.
6 x 8 to 10 x 15	$ 7.50	$ 6.75	$ 6.25	$ 5.75
11 x 14 to 16 x 24	8.50	7.75	7.25	6.50
13 x 22 to 20 x 30	10.75	9.75	8.75	7.75
15 x 36 to 24 x 30	12.25	10.75	9.00	
26 x 28 to 24 x 36	13.00	11.50	9.75	
26 x 37 to 26 x 44	14.50	13.25	10.75	
26 x 46 to 30 x 50	15.00	14.00	11.25	
30 x 52 to 30 x 54	16.00	14.50	12.00	
30 x 56 to 34 x 56	17.25	15.50	13.50	
34 x 58 to 34 x 60	18.25	17.25	15.00	
36 x 60 to 40 x 60	20.75	18.75	17.25	

Double Thick.—Discount 60&10 %

SIZES.	1st.	2d.	3d.	4th.
6 x 8 to 10 x 15	$12.00	$11.00	$10.00	$ 9.25
11 x 14 to 16 x 24	13.75	12.50	11.75	10.50
18 x 22 to 20 x 30	17.25	15.75	14.00	
15 x 36 to 24 x 30	19.75	17.25	14.50	
26 x 28 to 24 x 36	21.00	18.50	15.75	
26 x 36 to 26 x 44	23.25	21.25	17.25	
26 x 46 to 30 x 50	24.00	22.50	18.00	
30 x 52 to 30 x 54	25.75	23.25	19.25	
30 x 56 to 34 x 56	27.75	25.00	21.75	
34 x 58 to 34 x 60	29.25	27.75	24.00	
36 x 60 to 40 x 60	33.25	30.00	27.75	

Sizes above 40 x 60—$10.00 per box extra for every five inches.
An additional 10 per cent. will be charged for all Glass more than 40 inches wide. All sizes above 52 inches in length, and not making more than 81 united inches, will be charged in the 84 united inches bracket.

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Special Steel

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Turns out at least **double work** by increased speed and feed, and cuts **harder metals** than any other Steel. Neither hardening nor tempering required.

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DUPONT'S

Sporting, Shipping, and Mining

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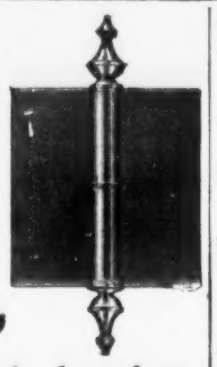

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Single or Double Handle, Reversible Mortise Latch,
Patented January 9, 1877.
Oilable Axle Pulleys,
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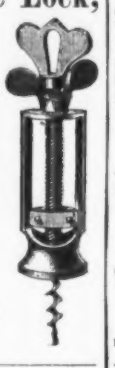
FACTORIES, Westville, Ct.



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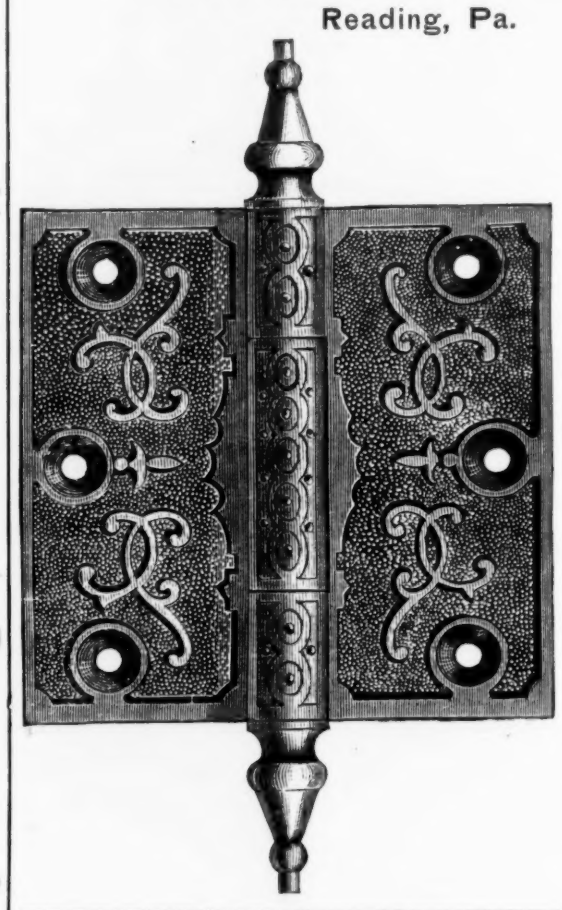
RICK BROTHERS,
Reading, Pa.



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DRILLED CAST BUTTS, AXLE PULLEYS, BRONZED AND JAPANNED BRACKETS, GRINDSTONE HANGINGS, HAY FORK PULLEYS, HAT and COAT, HARNESS AND SCHOOL HOUSE HOOKS, DOOR LATCHES, BARN DOOR HANGERS and RAIL, APPLE PARERS, WALL SAFES or CYLINDER RINGS, and BUILDERS' and SHELF HARDWARE GENERALLY.
PARTICULAR ATTENTION PAID TO GOODS FOR EXPORT.

E. E. YATES & CO., Agents.
New York Warerooms, 103 Chambers St.

HERMANN BOKER & CO.,
OFFICES AND WAREHOUSES:
NEW YORK, 101 and 103 Duane and 91 and 93 Thomas Streets.
REMSCHEID and SOLINGEN (Prussia.) H. BOKER & Co.
SHEFFIELD (England), No. 3 Arundal Lane, Represented by Mr. ARTHUR LEE.
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Manufacturers and Importers of **Cutlery, Guns, Hardware** and **Railroad Material.**
Proprietors of **TRENTON VISE AND TOOL WORKS, Trenton, N. J.**—Vises, Picks, Mattocks, Grub Hoes, Sledges, Hammers, Bridge Work, Turn Tables, etc.
Proprietors of the **MANHATTAN CUTLERY CO.,** "O. K." Razors.
LAMSON & GOODNOW MFG. CO., Shelburne Falls, Mass.—Table Cutlery and Butcher Knives.
W. & S. Butcher's Files, Edge Tools and Razors, the largest stock in the United States.
Geo. Wostenholm & Son's Knives, Scissors and Razors, the largest stock in the U. S.
John Wilson's Butcher and Shoe Knives.
Peter Wright's and Armitage Anvils.
We always have on hand a full assortment of
German and English Hardware, Cutlery, Guns, Gun Material, Chains, Heavy Goods.

True Merit & Excellence is the Basis of all Success
THE EUREKA
STEAM AND HYDRAULIC PACKING.

The results of a long series of experiment made with a view of meeting all the requirements of a Perfect Packing. And we assert without any reservation that it is the **best** article of its kind yet invented. It is made of the best materials, is elastic, pliable, and does not become hard by use, consequently is easily taken out when renewal is necessary. It has a rubber center, rectangular in form, covered with a series of braids of linen, between which is placed a lubricative compound superior to anything ever before used for the purpose, and contains nothing that can in any manner cut, flute or gum the rods, no matter how long run. It has thus far received the highest praise of every engineer who has used it, and we have received many testimonials from the proprietors of Mills, Factories, Iron Works, &c., that it is the most durable, efficient and cheapest Packing they ever used. All we ask is a fair trial, knowing it will convince better than any words of ours. Orders promptly filled.

SYMONDS & CO., 120 Exchange Place, Phila.,
Sole Manufacturers.
Or WICKERSHAM & CO., Gen'l Agents, 403 Library St., Phila.

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Walter R. Wood,
GRINDSTONES.
SOLE AGENT OF THE
BEREA STONE CO., of Ohio,
NOVA SCOTIA and other brands.
283 & 285 Front Street, New York.

WORTHINGTON & SONS,
North Amherst, Ohio.
Manufacturers of
Lake Huron Amherst and Berea
GRINDSTONES.

SUPPLIES
FOR
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Gum and Leather Belting, Packings and Cotton Waste, Babbit Metal.
FINE TOOLS
for Machinists and Amateurs; Barnes' Foot Power Scroll Saw; Foot Lathes all kinds. Sole Agents Baxter Steam Engine. Iron and Wood Working Machinery. Send for Price Lists.
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Steam Oil Stone Works.
F. E. DISHMAN,
Successor to WM. GALBREATH & CO.
Manufacturer of and Dealer in the Best
Washita, Arkansas, Hindostan and Sand
STONES,
☞ Of various sizes and patterns, suited to every variety of Mechanical use. **New Albany, Ind.**
Send for price list.

BOYD & CHASE,
The largest manufacturers in the world of
OIL  STONE

Of all description.
107th Street and Harlem River,
Send for Price List. **NEW YORK.**

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A. PARDEE, Hazelton, Pa. J. G. FELL, Phila.
A. PARDEE & CO.,
303 Walnut St.,
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No. 111 Broadway, New York.
MINERS AND SHIPPERS OF
Lehigh Coals.
The following superior and well known Lehigh Coals are mined by ourselves and firms connected with us, viz.

A. Pardee & Co. { HAZLETON, CRANBERRY, SUGAR LOAF.
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Sole Proprietors, Miners & Shippers of the celebrated
POWELTON
SEMI-BITUMINOUS
COALS.
THE BEST & CHEAPEST
In the market for the use of Ocean Steamers, Tugs, Steamboats and Locomotives, Stationary Engines, Steel Makers, Rolling Mills, Puddling Furnaces, Glass Manufacturers, Blacksmithing, Brick and Lime Burning, and General Industrial Purposes.
These coals can be delivered to all points reached by railroad or navigation.

Lehigh Valley Coal Co.,
MINERS AND SHIPPERS OF
Lehigh, Wyoming White & Red Ash
(BALTIMORE VEIN.)
Office, cor. Cortlandt & Church Sts.
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GEORGE B. NEWTON, Agent. Shipments by Railroad and Morris Canal direct from the mines, and from Perth Amboy and Jersey City, for all Points.

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Dealers in
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Retail Yard on D. L. & W. Railroad, cor. Grove and 19th Sts., Jersey City. Coal delivered direct from Mines to Carts and Wagons. Families and manufactories supplied with the best qualities of Coal at the lowest rates.
OFFICES At Yard cor. Grove and 19th Sts.; cor. Bay St. and Newark Ave., Jersey City; Room 38, 111 Broadway, N. Y. General Office, Bank Building, cor. Newark and Hudson Sts., Hoboken. P. O. Box 361, Hoboken.

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Wheeling, West Va.,

Manufacturers of

Wrought Butts, Strap & T Hinges, Wrought Hooks, Hasps & Staples, Wrought Repair Links & Washers,

GRAHAM & HAINES, Sole Agents, 113 Chambers & 95 Reade Sts., N. Y.

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Hardware, Cutlery, &c.

85 Chambers & 67 Reade Sts., N. Y.

Depot for THOS JOWITT & SONS, (Sheffield, England,) FILES and HORSE RASPS.

Rough & Ready And CLIPPER SCYTHES, Warranted.

Manufacturers of the

Patented March 4, 1873.

Agents for Norwich Lock MFG. CO.

"BEAVER" American) FILES and HORSE RASPS.

"WIDE AWAKE" AXES.

"FELTER'S PATENT LOCKS,"

MANUFACTURED BY

The American Lock Mfg. Co.,

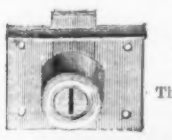
Are the most **SECURE** and **DURABLE** ever made.

SECURE

Because they have 40 Brass Tumblers, independent in their action, either one of which will prevent the Lock from being opened unless brought to proper position by the Key.

DURABLE

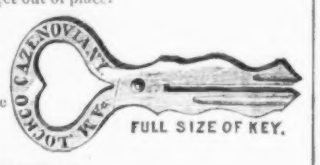
Because we use no Springs to break or get out of place.

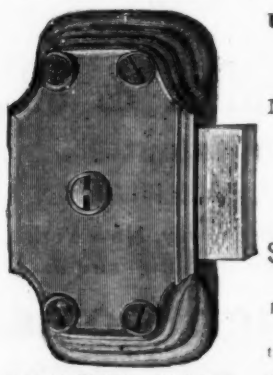


THEY HAVE

STERLING METAL KEYS

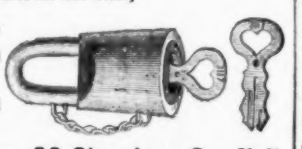
That will not corrode or wear, and are stronger than steel.





Upright Rim Dead Locks,
Horizontal Rim Night Latches,
Horizontal Rim Tubular Night Latches,
Mortise Night Latches, Plain Fronts,
Mortise Night Latches, Ornamental Bronze Fronts and Knobs,
Brass Chest, Box, Cupboard and Drawer Locks,

Solid Bronze Padlocks.



Illustrated Catalogue and Price List sent on application.

All orders should be addressed to

UNION NUT CO., General Agents, 99 Chambers St., N. Y

LIGHTNING HAY KNIVES,

WEYMOUTH'S PATENT.

This knife is the best in use for cutting down hay and straw in mow and stack, cutting fine feed from bale, cutting corn stalks for feed, cutting peat and ditching marches.

The blade is best cast steel, spring temper, easily sharpened, and is giving *universal* satisfaction. A few moments trial will show its merits, and parties once using it are unwilling to do without it. Its sales are fast increasing for export as well as home trade, and *seems destined* to take the place of all other Hay Knives.

They are nicely packed in boxes, one dozen each, of 50 lbs. weights, suitable for shipping by land or water to any part of the world.

Manufactured only by

Hiram Holt & Co.,

East Wilton, Franklin Co., Maine.

For sale by the Hardware Trade generally.

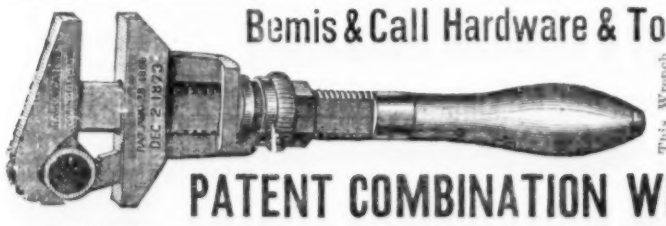
TACKS

of all kinds, Made of Iron, Steel, Zinc, and Copper, of any Size or shape.

Manufactured by

BRIGHAM, LITCHFIELD & VINING, South Abington, Mass.

Bemis & Call Hardware & Tool Co.



This Wrench can be furnished with Briggs' Pat. Nut or Sleeve.

PATENT COMBINATION WRENCH.

These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, Case-hardened throughout, and not only combine all of the superior qualities of our cylinder or Gas Pipe Wrenches, but also all requisite Combinations of a regular Nut Wrench, thus making a Combination which has no equal.

For Circulars and Price List, address,

BEMIS & CALL HARDWARE & TOOL CO. Springfield, Mass.

METALLIC SIEVES.

Protected by 14 patents.

MANN'S PATENT.

Best Sieve known, Cheap, Neat and Durable.

ADAMS & WESTLAKE MFG. CO.,

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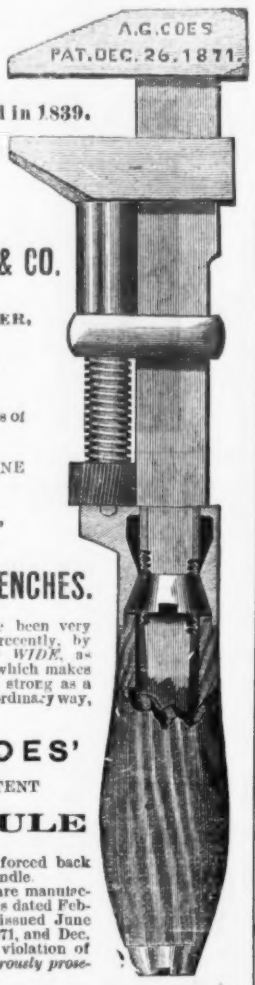
GRANT & CO., Newark, N. J

Cap Rifles & Targets.

Established in 1839.



A. G. COES & CO.

WORCESTER,

Mass.,

Manufacturers of

THE GENUINE

COES'

SCREW WRENCHES.

Our goods have been very much improved recently, by making the *Bar WIDE*, as shown in the cut, which makes a 12 in. Wrench as strong as a 15 in. made in the ordinary way, and by using

A. G. COES'

NEW PATENT

FERRULE

Which cannot be forced back into the handle.

☞Our goods are manufactured under Patents dated February 7, 1860, (re-issued June 29, 1871), May 2, 1871, and Dec. 26, 1871, and any violation of either will be *rigorously prosecuted.*

We call particular attention to our new Patent Ferrule, with its supporting Nut (shown in section in the above cut), which makes the strongest Ferrule fastening known.

A. G. COES & CO.

Our Agents, GRAHAM & HAINES, 113 Chambers St., New York, carry a full line of our goods, and will be pleased to serve you at factory prices.

Smith's Patent Improved.

THE BEST ADJUSTABLE HOLLOW AUGER MADE.

E. M. BIRDSALL & Co., Pen Yan, N. Y., write:

"The Tenon Auger, which you sent us on approval, we have fully and severely tested. It is the best tool for the purpose which we have seen or used."

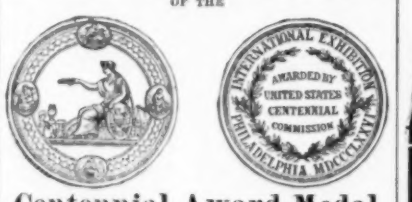
CHAS. M. GHRISKEY,

Manufacturers' Agent,

508 Commerce Street, Philadelphia, Pa.

FAC-SIMILES

OF THE



Centennial Award Medal

Executed on Glass "en Relief," for outside show, from 8 to 24 in. diameter, by the

Otto Stietz N. Y. Glass Letter Co.,

611 Broadway.

Advertising Glass Signs a specialty.

COBB & DREW,

Plymouth, Mass.

Manufacturers of Copper, Brass, and Iron Rivets: Common and Swedes Iron, Leathered, Carpet, Lace and Glass Tacks; Finishing, Hungarian, Trunk Clout and Cigar Box Nails, &c. Rivets made to Order.

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HARDWARE.

165 Greenwich Street.

Agent for the Philadelphia Star Carriage and Tire Bolts.

Lloyd, Supplee & Walton,

HARDWARE FACTORS.

MANUFACTURERS OF

Bonney's Hollow AUGERS.

Stearn's Hollow Augers and Saw Vises

Bonney's Spoke Trimmers

Double Edge Spoke Shaves

Adjustable Gate Hinges

Scandinavian Pad Locks

Flat Key Brass and Iron Pad Locks, &c., &c.

625 Market St., Phila., Pa.

ENTERPRISE MFG. CO., Philadelphia.

AMERICAN COFFEE, SPICE, AND DRUG MILLS.

MEASURING FAUCETS.

CHAMPION TOBACCO, HERB AND ROOT CUTTERS

ROTARY CORK PRESSERS.

BUNG HOLE BORERS.

SAUSAGE STUFFERS.

FRUIT, LARD AND JELLY PRESSES.

TINCTURE PRESSES.

SELF-WEIGHING CHEESE KNIVES.

&c., &c., &c.

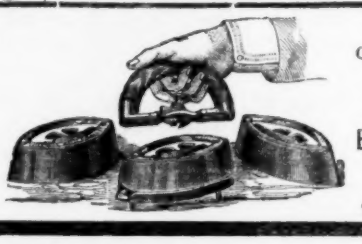
Enterprise Mfg. Co.

Make the

Only Irons Filled with Non-Conducting

FIRE CEMENT.

Send for circular and price list.



MRS. POTTS'

COLD HANDLE SMOOTHING AND POLISHING IRONS.

Are made by

Enterprise Mfg. Co.

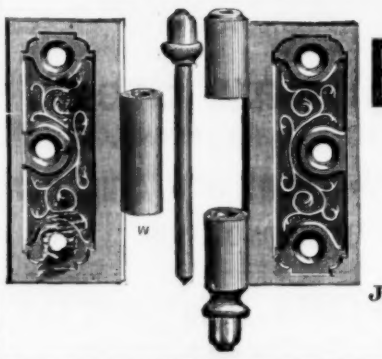
PHILADELPHIA,

And sold by

THE HARDWARE TRADE.

CLARK & CO.,

MANUFACTURERS OF



BUILDERS' HARDWARE.

426 & 428 Niagara Street, BUFFALO, N. Y.

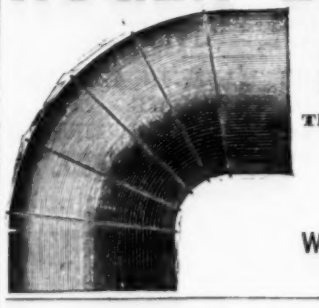
J. CLARK WILSON & CO., Agents,

81 Beekman St., New York.

Send for Catalogue and Price List.

HOGEN ELBOW COMP'Y,

MANUFACTURERS OF PATENT



Sheet Metal Elbows.

This Elbow has no crimps, cavities or angles, which cause accumulations that rust or corrode the iron, and it is also easily polished and kept clean.

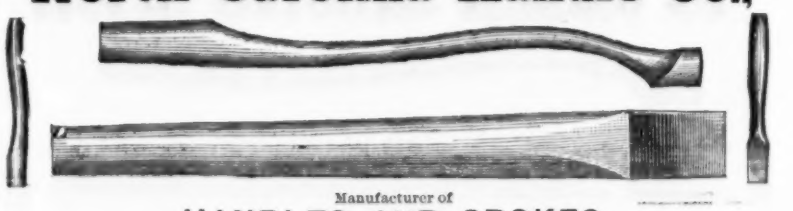
WORKS—Foot of Wasson St., near Lake Shore,

CLEVELAND, O.

V. G. HUNDLEY.

Proprietor of

North Carolina Handle Co.,



Manufacturer of

HANDLES AND SPOKES.

Handles for export a specialty] ***79 Reade and 97 Chambers Street New York***

PHILADELPHIA.

(Corrected weekly by Lloyd, Supplee & Walton).

Terms, 30 days. For 60 or 90 days, interest added at 10 per cent. per annum.

Anvils.
Peter Wright's, ₱ ℔, gold.....10½c
over 250 lbs.....11c. gold, net
Wilkinson's, ₱ ℔. gold.....11c. net
Eagle (American).....9 cents per lb—dis 20%

Apple Parers.—
Reading No. 72.....per doz $ 5 50 net
" " 75..... " 6 25 net
" " 76..... " 7 00 net
" " 77..... " 7 50 net
Peach Parers..... " 10 00 net
Little Favorite, corer and slicer..... " 7 50 net
Lots of 10 to 25 dozen special price.

Axes.—
Mann's Red Warrior .....Per doz. $8 50 @ 9 00 net
Red Indian..... " 8 50 @ 9 00 net
Red Chieftain, bevelled..... " 9 00 @ 10 00 net
Crown Prince..... " 9 50 @ 10 50 net

Augers and Auger Bits.—
Bates' Nut Augers. ... .dis 40&10 @ 50 %
Cook's Augers.....dis 50 @ 5 & 5 %
Watrous' Ship Augers.....dis 15 %
Benjamin Pierce Auger Bitts.....dis 40 %
Griswold Auger Bits.....dis 40&10 @ 50 %
Cook's " " .....dis 50 @ 50&5 %
Jennings' " " .....dis 10 %
Bonney's Pat. Hol. Augers, list $48 ₱ doz.. dis 25&10 %
Stearns' Pat. Hol. Augers " $48 " ....dis 25&10 %

Balances.—
Light and "Common".....dis 25&10 %
All other Spring Balances.....dis 25 %

Bells.—
Bevin Bros. Mfg Co. Light Hand Bells.....dis 70 @ 75 %
Iswiss Pattern Hand Bells.....dis 50 @ 50&10 %
Connell's Door Bells.....dis 50 @ 50&10 %
Gt. Western & Kentucky Cow, new list. .....dis 50 %

Boring Machines.—
Upright, with augers, $5 00; without augers..$3 00 net
Angular, " 6 00; " 4 00 net

Bolts.—Eastern Carriage Bolts .....dis 75&37 ½—cash
Philadelphia " " .....dis 60&10 @ 60&20 %
Stanley, Wrought Shutter.....dis 50&10 @ 60 %

Braces.—Barber's.....dis 40&5 %
Backus.....dis 50 @ 5&10 %
Snofard.....dis 50 %
American Ball.....dis 25&10 %

Butts.—Cast Fast Joint, Narrow.....dis 50&10 %
" " Broad.....dis 60&10 %
Cast Loose Joint.....dis 65&10 %
" Acorn, Loose Pin.....dis 65&10 %
" Acorn " Jap'd.....dis 67½&10 %
" Mayer's .....dis 65&10 %
" Parliament.....dis 60&10 %
Wrought Loose Pin.....dis 40&10 %
" Table Hinges and Back Flaps.....dis 55&10 %
" Narrow.....dis 40&10 %
" Loose Joint.....dis 40&10 %

Blind Butts.
Parker.....dis 60 @ 60&10 %
Clark.....dis 60 %
Shepard.....dis 60 %
Lull & Porter.....dis 65 @ 65&10 %
Huffer's.....dis 40 %

Chains.—German Halter and Coil.....dis 30&5 % gold
Galvanized Pump..... ₱ ℔ 10½c net
Best Proof Coil Chain—(English).

₱ ℔.....	11½	8¼	7¾	7½	8¼	8¼	7c gold
	3-16	¼	5-16	⅜	7-16	½	⅝ in.

Chisels.—Socket Framing.....dis 65, 5&10 %
Socket Firmer.....dis 65, 5&10 %
Butcher's.....$5 00 to £ gold

Coasters.—Bed .....dis 50&10 %
Plate.....dis 50&10 %

Coffee Mills.—Box and Side.....dis 25 %
Enterprise .....dis 20 %

Cutlery.—Wallen Pocket.....dis 30 @ 35 %
Landers, Frary & Clark, J. Russell & Co., Lamson & Goodnow Mfg. Co. and Meriden Cutlery Co., Manufacturers' prices net

Drawing Knives.—
Hart Mfg. Co.'s .....dis 65, 5&10 %
Adjustable Handle.....dis 20 %

Fry Pans.
Tinned.....dis 50&10 @ 60 %

₱ doz..$	3 50	4 00	4 50	5 00	5 50	6 50	7 50	9 00	10 00
No....	0	1	2	3	4	5	6	7	8

Burnished.....dis 50&10 @ 60 %

₱ doz..$	3 00	3 75	4 25	4 75	5 25	6 00	7 00	8 00	9 00
No....	0	1	2	3	4	5	6	7	8

Files.
Nicholson.....new list, dis 30 %
Disston..... " dis 30 %
Butener.....$4 50 @ $4 75 £ gold
Spencer.....4 50 @ 4 75 £ gold

Fluting Machines.
Imperial—4¾ in. roll.....each $2 50 net
" —6 in. roll..... " 3 00 net
Crown—4¾ in. roll..... each 2 50 net
" —6 in. roll..... " 3 00 net
" —8 in. roll..... " 4 25 net
Eagle—3½ in. roll.....per doz. $18 00 net
" —5½ in. roll.....per doz. 24 00 net
Geneva Fluter.....per doz. 15 00 net
Favorite com. Fluter & Sad-iron..₱ doz $15 00 dis 15 %

Hammers.
Yerkes & Plumb's.....dis 25 @ 30 %
Hammond & Son's.....dis 25 @ 30 %

Hatchets.
Yerkes & Plumb.....dis 25 @ 30 %
Hammond.....dis 25 @ 30 %
Hunt.....dis 25 %

Hinges.
Strap and T.....dis 60 @ 60&5 %

Horse Nails.

	Nos.	5	6	7	8	9	10
Ausable		30	27	25	24	23	22
" Ptd & Polished		31	28	26	25	24	23
Globe		31	28	26	25	24	23
Clinton Horse Nails		20	18	17	16	15	
" Polished and Pointed		21	19	18	17	16	

Southern, all sizes.....₱ ℔ 14c. net
Discount on Ausable & Globe, 20 %; Clinton, 15 %

Locks and Knobs.
Branford.....new list, dis 6¼&10&2 % cash
Gaylord Cabinet.....dis 25&2 % cash
United States Lock Co.....dis 35 %
American Padlocks.....dis 33⅓, 5&2 % cash
Scandinavian Pad Locks.

₱ doz...	$7 50	9 00	10 50	12 00	15 00	18 00	22 00	} 60&10 %
No.....	57	53	59	60	61	62	64	
₱ doz.....		$21 00		35 00		40 00		} 60 %
No.....		64		65		66		

Lanterns.—
Square Candle and Oil.....₱ doz. $2 75 @ 3 00
Tubular.....No. 0, $10 50; No. 1, 12 50 ₱ doz. net
Guards, 50 cents extra per doz., net.

Mattocks.—
Long and Short Cutter.....₱ doz. $9 00 @ 9 50 net
Pennsylvania Pattern..... " 9 50 @ 10 00 net

Molasses Gates.
Enterprise Mfg. Co.'s Measuring Faucets.....dis 20 %
Stebbins' Gates.....dis 62½&10 %
Lincoln's " .....dis 62½&10 %
Landers, Frary & Clark's Petroleum.....dis 20&10 %
Brass Liquor Cocks .....dis 50 %
Cork Lined " .....dis 65 @ 65&10 %

Meat Cutters.—Dixon's.....dis 25 @ 30 %
Woodruff.....dis 25 @ 30 %
Stowe.....dis 25 @ 30 %
Hale's.....new list, dis 50&2 %
American.....dis 25 %
Stuffers.....dis 25 @ 30 %
Enterprise Stuffers.....dis 20 %

Planes.—Sandusky.....dis 40 %
Ogonta.....dis 50&10 %
Bailey.....dis 25&10 %

Plane Irons.—Sandusky.....dis 10 %
Butcher's.....gold £, $5 00

Plumbs and Levels.
Stanley's Adjustable.....dis 60&10 %
" Non-Adjustable.....dis 60&10 %

Picks.—Philadelphia.....dis 50 %
Hunt's .....dis 25 %

Rules.—Stanley Boxwood.....dis 50&10 %
Stanley Ivory.....dis 40&10 %

Steelyards.—Hart's Pattern.....dis 60&10 %

₱ doz....	$14 50	15 75	21 00	26 50	31 50	35 50
Lbs.....	50	100	150	200	250	300

American Pattern.....dis 25 @ 25&10 %

₱ doz.....	$5 50	7 00	9 00	10 00	11 00	12 00
Lbs.....	50	100	150	200	25	300

English Pattern.....dis 25 @ 25 %

₱ doz.....	$7 00	8 67	10 67	12 67	14 67	16 67
Lbs.....	50	100	150	200	250	300

Squares.—
Steel and Iron.....dis 50 %; full case, dis 50&10 %
Try Squares, Stanley.....dis 45&10 %
Disston's Try Squares.....dis 45 %

Scythes.—Golden Clipper, Damascus Blade, Boxed and Sharpened..... ₱ doz. $7 00 net
Clipper No. 10, Brush Blade Boxed and Sharpened..... ₱ doz. $8 50 net
Clipper No. 5, Painted Red, Boxed and Sharpened..... ₱ doz $8 25 net

Saws.—Disston's Hand, Panel and Rip.....dis 20 %
Disston's Circular.....dis 30 %
" Cross-Cut No. 2, Plain Tooth..₱ ft., 45c net
" " Patent Tooth.....₱ ft., 45c. net
" " Champion Tooth....₱ ft., 35c. net

Shovels and Spades.
Rowland.....dis 50&5 %
Oliver Ames & Sons, new list.....dis 30 %

Sad Irons.—4 to 10 lbs..... ₱ ℔.. 2¼ @ 2¾c
Mrs. Potts' Patent.....dis 30 @ 40 %

Stone.—Arkansas Oil Stone..... ₱ ℔ $1 25 net
Washita Extra..... " 50c. net
" No. 1..... " 30c net
" " 2..... " 25c net
" Slips..... " 6c net
" Axe..... " 25c net
Turkey Oil Stone No. 1..... " 16½c net
" " 2..... " 16c net
" Axe Stone..... " 25c net
Hindostan Oil Stone No. 1..... ₱ ℔ 4 @ 4½c net
" Axe Stone..... " 5 @ 5½c net

Screws.
United States and others in Combination....dis 60&10 %

Spoons.—
Plated.....dis 40 @ 40&5 %
German Silver.....dis 25 %
Britannia, Boardmans.....dis 50&10 %
" Parkers.....dis 50&10 %
Tinned.....dis 70 %
" by case.....dis 20 %

Springs.—Torrey..... ₱ doz $2 00 @ 2 10 net
Philadelphia .....5 in., $5 00; 8 in., $7 00 ₱ doz. dis 25 %
Chatfield.....No. 1, $3 50; 2, $4 00; 3, $6 00 ₱ doz. net
Gem Coil No. 1, Large Jap'd..... ₱ doz $3 50 } dis
" " No. 2, Medium Jap'd..... " 2 50 } 25 %
" " No. 3, Small..... " 2 00 }

Stocks and Dies......dis 10&5 %

Stove Polish.—Gem..... ₱ gross, $4 25 @ 4 50 net
Dixon..... " $5 75 @ 6 00 net
Onyx..... " $4 00 @ 4 25 net

Tacks, Brads, &c.
Tacks, Half Weight American....dis 75& 20 %
" Full " .....dis 50&20 %
" Half " Swedes.....dis 65&20 %
" Full " " .....dis 30&20 %
" Carpet, Am. and Swedes ..dis 35&20 % } dis 10 %
" " Leather Head.....dis 20 % } cash
" Copper..... ₱ ℔ 5c., dis 20 %
Brads, Half Weight.....dis 50&20 %
Shoe Nails—
4-8 and larger, 9c; 3½-8, 9½c ₱ ℔. dis 20&10 %
Trunk, Clout and Finishing Nails—

⅝	½	⅜	¼	1	1¼ and over
25.	20.	17.	15,	13.	11c ₱ ℔., dis 20&10 %

Double Pointed Tacks .....dis 40&5 %

Traps.
Genuine Oneida—Newhouse.....dis 30 %
Im. Oneida—Newhouse list (1st qual.).....dis 60 %

Vises.—Solid Box, Trenton..... ₱ ℔ 11½ @ 12½c net

Wrenches.—
Girard (Coe's Pattern).....dis 50&10 %, case 50, 10&5 %
Agricultural—
₱ doz 10 in., $3 60; 12 in., $5 40 net; case dis 5 %
Coes' Genuine.....dis 50&5 %
" Pat. Wrot Bar .....dis 60 @ 60&10 %
" " Mall " .....dis 75 %
Taft's " Wrot " .....dis 75 %
Pulla. Tool Co., Duplex.....dis 25 %

Wire.—
Bright or Aun'd, No. 0 to 18.....dis 52½ @ 55 %
" " No. 19 to 26.....dis 57½ @ 60 %
" " No. 27 to 36 .....dis 60 @ 62½ %
Coppered 0 to 18.....dis 47½ @ 50 %
Tinned Broom Wire.....dis 42½ @ 45 %
Galvanized, No. 7 to 18 .....dis 22½ @ 25 %

Wringers.—Novelty No. 10.....₱ doz. $63 00 net
Novelty No. 2 ..... " 66 00 net
Universal, No. 2½ ..... " 63 00
" No 2..... " 66 00

BUFFALO.

Reported by Messrs. Sidney Shepard & Co.
Sept. 1, 1877.

Apple Parers—Bay State.....per doz $12 00
Faultless Turn Table..... " 7 50
Lightning..... " 7 50
Peach Parers..... " 12 00
Potatoe Parers..... " 12 00
Climax Corer and Slicer..... " 6 00
Bells, Cow—Yaw a Genuine.....dis 50 %
Braces—Bit, Spofford's Patent.....dis 50 %
Brass—Sheets.....dis 50 %
Boards—Stove, Brooks' Pat..dis 40 % 4 mos.; 40&5 % 30 days
Bolts—Stove..... list net
Brick—Bath (box of 2 doz) Best English..... $1 12
Can Openers—Sprague's .....dis 55&10 %
Cases—Parlor Coal Hod.....dis 25 %
Chisels—Firmer Socket.....dis 60, 10&10 %
" Framing Socket.....dis 60, 10&10 %
" Corner Socket Chisels.....dis 60, 10&10 %
" Slick's Carpenters'.....dis 60, 10&10 %
Castings—Malleable .....dis 45 %
Cocks—Globe and Bibb..... ₱ ℔ 7½c
Cutters—Meat, "Hales".....dis 45 %
Egg Beaters—"Dover".....per doz $4 00
" Familv " ..... per doz $2 75
Elbows—Corrugated.....dis 20 %
Adjustable.....dis 20 %
Columbus.....dis 20 %
Files—Maischoss Bros.....dis 25 %
Fluters—Geneva Hand.....₱ doz. $15 00
Freezers, Ice Cream—"Champion".....dis 33⅓&5 %
Hinges, Gate—Shepard's.....dis 45 %
Hinges—Window Blind—
Shepard's and Standard.....dis 60 %
Hods, Coal—Plain, Black and Galvan'd...new list dis 25 %
Funnel, Black and Galvanized..... " dis 25 %
Fancy and Helmet..... " dis 25 %
Sad Irons.....
Kettles—Brass..... ₱ ℔. 45c
Copper, "Hand Made"..... ₱ ℔. 45c
Enameled.....36c.
Knives, Drawing—Oval No. 1.....dis 60, 10&10 %
Razor Blade.....dis 60&10 %
Lanterns, Tubular—with guard.....$1 50
Without guard.....10 00
Mills, Coffee—Box and Side, common.....dis 25 %
Box Union and Eagle.....dis 25 %
Cut Nails, "Chesapeake," 10d.....dis 30 %
Horse, Ausable.....No. 5 6 7 8 9 10
30 27 25 24 23 22c
" " Pointed & Polished.....add 1c ₱ ℔
" " 1000 lbs.....
Paint—White Lead, U. S. Gov't..... ₱ ℔ 8c
Pans—Dripping..... ₱ ℔ 9c
Frying..... " 9c
Rivets—Iron, Black and Tinned.....dis 50 %
Screws—"American Screw Co"—.....dis 40 %
Flat Head, Iron.....dis 60&10 %
Flat Head, Brass.....dis 55 %
Sieves—Wood, Hoop Iron.....$1 20
Tinned..... 1 50
Sifters—Ash.....$9 00 @ $12 00
Skates and Straps—White's.....dis 30 %
Spoons, Iron Tinned, by the case.....dis 10 %
" dis 40&5 %
S. S. & Co., Kitchen.....dis 20 %
Plated Rogers' A No. 1.....dis 35 %
Britannia..... " 25 %
G. S. Hall, Elton & Co.....dis 25&5 %
Scales—Buffalo Scale Works.....dis 25 %
Fairbanks.....dis 15 %
Stove Polish—Gem..... ₱ gross, $4 50
" Dixon's..... " 6 00
Palace ..... ₱ gross, $3 00 bulk, per ₱ ℔.. 9c
Rising Sun..... " gross, $5 75
Squeezers—Lemon, Porcelain..... ₱ doz., $5 40
Tacks—Half Weight Am. Iron.....dis 75&20 %
Tea Trays.....dis 25 %
Thermometers—Tin Case.....dis 50, 10&10 %
Tools—Tinmens'.....dis 10 %
Vases—Palace Cor.....dis 25 %
Vises—
Parallel, Buffalo.....dis 30 %
Wire—Brass and Copper.....list net
Wire—Bessemer Steel.....dis 25 %
Wringers—Novelty..... No. 2, $55 00; No. 10, $63 00
Tin Plates.—Add for each X.....2 50
10x14, IC. Charcoal.....$7 25 | 14x20 C. terne.....$6 75
12x12, " .....7 25 | 30x28 C. " 14 50
12½x17, " .....6 75 | 30x28 X. " 13 50
14x20, " .....6 75 |
Pig Tin—Straits.....20c @ 21c
Bar Tin.....24c
Solder—S. S. & Co. No. 1.....18c
S. S. & Co. Extra.....15c
Sheet Zinc—
"Lasalle".....570 ℔ casks 10c ₱ ℔
$8 00 8 50 ₱ 100 lbs
Sheets.....$8 00
Babbitt Metal.....₱ ℔ 12c
Iron Wire—Bright and Annealed.....dis 52½ %
Coppered.....dis 47½ %
Tinned.....dis 35 %
Tinned Broom, ½ Nos. 20 21 22 } dis 40 %
20c 21c 21c }
Copper—Sheathing 14 @ 18 oz..... ₱ ℔. 28c
Planished..... ₱ ℔ 36c
" Boiler Sizes..... ₱ ℔ 38c
Bottoms..... ₱ ℔ 36c
Bolts..... ₱ ℔ 34 @ 32c
Braziers' Sheets..... ₱ ℔ 30 @ 32c
Sheet Iron.
18 Common.....$3 05
24 Common.....3 25
26 Common.....3 45
24 W. D. Wood & Co., Smooth Finish.....4 25
Planished..... A. B.
Gen. Russia, No. 1 stained..... 11c 9½c
" " clean.....12½c
Galvanized.....dis 35 %
Tin Ware.
Deep Stamped Plain and Retinned .....45 %
Com. " " .....dis 35 %
Japanned " " .....dis 35 %

CHICAGO.

(The Chicago Stamping Co., 72, 74 & 76 Lake St.)
June 14, 1877.

Tin Plate.—
10x14, IC. Ch'l. Good.....
10x14, IC, " Best, 7 75
10x14 IX, " " 10 25
12x12, IC. " " 7 75
12x12, IX, " " 10 25
14x20, C. " " 7 75
14x20, IX, " " 10 25
20x28, IC, Charcoal Roofing, Good.....
20x28, IC, " Best.....
20x28, IX, " "
10x14, IC, Coke Plates.....
14x20, IC, " .....
10x20, IC, " .....
14x20, IXX, Ch'l Best. 12 75
14x20, IXXX " " 15 25
DC, 100 Plate " " 7 75
DX, " " 10 25
DXX, " " 12 75
DXXX " " 15 25
IC, Roofing, " " 7 25
IX, " " 9 75
14 50
15 00
19 50
6 75
7 25
11 00
Block Tin.—
Large Pigs .....20c | Bars.....22c
Small.....21c
Zinc.—sheet, 500 to 1000 lb. Casks.....7½c
Loose Sheets.....8 c
Slab Zinc or Spelter.....7 c
Copper.—Bottoms.....32c
Sheathing.....30c
Planished.....37c
" Boiler lengths.....39c
Bolt.....35c
Brazlers' Sheets.—
30x60, 6 to 7 lbs.....₱ ℔ 6c | 30x60, 10 to 12 lbs...₱ ℔ 32c
30x60, 8 to 9 lbs..... " 34 | 30x60, 15 to 100 lbs. " c
Solder.—F. S. & Co.'s make
Best Fine.....16c
No. 1.....15c
Roofing.....13c
Braziers or Sticker Solder.....35c
Antimony.....18c
Babbit Metal—F. S. & Co.'s.....16c
No. 2.....14c

Sheet Iron.—

	Common.	Smooth Com.	Smooth Charcoal.	Smooth Jun.Iata
No. 24.....	3·20c	4·1c	6 c	8 c
25 & 26...	3·10c	4·6c	6½c	8½c
27.....	3·00c	4·5c	6½c	8½c

Galvanized Iron.—
No. 16 to 20.....12c | No. 27..... 15c
21 to 24.....13c | 28..... 16c
25 & 26.....14c |
Russia Iron.— | No. 1 Stained.....12½c
Perfect..... 13½c | In Sheets, 1c. higher.
American Russia.— | B.....9½c
A.....11c | In sheets, 1c higher.
Lead.— | Lead Pipe, in full coils 8½
Pig.....7 c | Lead Pipe, when cut.. 9
Bar..... 7½ | Sheet Lead..... 9
Wire—Bright..... dis 47½
Coppered..... dis 40 %

PITTSBURGH.

The following are the Card rates, f. o. b. in Pittsburgh of Lewis, Oliver & Phillips, H. B. Newhall, 11 Warren St., New York, Agent.

Merchant Bar Iron.....2c rates net
Flat Rail (1¼x¼), punched and coun'sunk..3½c ₱ ℔ net
Iron Wedges.....3½c ₱ ℔ net
Norway Nail Rods, Vasa..... 7 c ₱ ℔ net
Iron Crow Bars (in ordering please state whether "Wedge" or "Pinch" point)...4 c ₱ ℔ net
Beetle Rings.....5½c ₱ ℔ net
Fence Pickets—
⅝ r'nd, bent to shape, 25c ₱ ft. of fence, less 15 % off net
Discount off Standard List.
Carriage and Tire Bolts, $500 worth purchased in six months, ending July and Jan. 1.....75, 5&3 % off net
Stove Bolts.....40 % off net
Elevator Bolts.....30 % off net
Machine and Square Head Bolts.....60 % off net
Coach and Lag Screws.....60 % off net
Bolt Ends.....60 % off net
Pat. Hot Pressed Sq. and Hex. Nuts.....7½c ₱ ℔ off net
Washers, all made from new band iron..7½c ₱ ℔ off net
Nuts and Washers in 25 lb. boxes, ½c ₱ ℔ ex. Nuts and Washers in lots less than one keg each size, ½c ₱ ℔ ex.
Nuts and Washers in 5 lb. boxes, 1c. ₱ ℔ ex.
Standard Caps, for Plows.....4½c. ₱ ℔ net
Iron Harrow Teeth, in lots of 1 ton or more, packed in 200 lb. boxes, 1 in. diam. 2¾c ₱ ℔ net; ⅞ in. diam. 2¾c ₱ ℔ net; ¾ in. diam. 3c ₱ ℔ net.
Pat. Headed Harrow Teeth, packed in boxes, ½c ₱ ℔ ex.
Skein Bolts, in bulk, in lots of 1 keg or more, ⅝ in. diam. 4½c ₱ ℔ net; 9-16 in. diam. 5½c ₱ ℔ net; ½ in. diam. 6½c ₱ ℔ net. ½c ₱ ℔ extra when less than 1 keg of each size is ordered.
Screw Hook and Eye Hinges, with Pat. Hooks, ⅜ to 1 in. diam., 7c ₱ ℔ net; ⅝ in. diam., 8c ₱ ℔ net; ½ in. diam., 10c ₱ ℔ net.
Screw and Strap Hinges—all sizes under 2s in. long have Pat. Hooks, 14 to 36 in. long, 3 4 10c ₱ ℔ net; 6, 8, 10 and 12 in. long, 4 9-10c ₱ ℔ net.
Strap & T Hinges.....60&10 % off net
Hereafter we will not make any allowances for freight on Strap and T Hinges; our price on them is F. O. B. in Pittsburgh.
Screw Hitching Rings, light, with ⅜ ring, No. 1, $4 00 ₱ 100 net; heavy, with 5-16 ring, No. 2, $4 50 ₱ 100 net.
Bridge and Roof Bolts—
1 to 2 in. diam. over 8 ft. long..... ₱ ℔ 3½c net
1 to 2 in. diam. from 4 to 8 ft. long..... " 3¼c net
1 to 2 in. diam. from 1½ to 4 ft. long..... " 3¼c net
⅝, ¾ and ⅞ in. diam. over 4 ft. long..... " 4 c net
⅝, ¾ and ⅞ in. diam. from 1½ to 4 ft. long " 4½c net
Bridge bolts with upset ends.....½c. ₱ ℔ extra
Wrought iron plates, punched.....4½c. ₱ ℔ net
Cast Iron Washers..... ₱ ℔ 3½c net
Grass Rods.....7½c ₱ ℔ net
Heel Bolts.....8½c ₱ ℔ net
Duck Nest Tuyere Irons.....$13 50 ₱ doz net
Wrought Iron Repair Links.....15 % off net
" Rings.....50 % off net
" Lap Rings.....33⅓ % off net

WAGON HARDWARE.

Single Trees, Neck Yokes and Double Trees, made from best selected Hickory, and ironed complete, in the most approved patterns.
No. 1 Southern Plow Single Tree, Ironed complete, Irons all Wrought.....each, 33c net
No. 2 Western Plow Single Tree, Ironed complete, Irons all Wrought.....each, 50c net
No. 3 Wagon Single Tree, Ironed complete, Irons all Wrought, except Malleable Ferrule.....each, 60c net
No. 4 Wagon Single Tree, Ironed complete, Irons all Wrought; Improved End Pieces riveted on; one side acts as a wear iron for wheel to rub against.....each, 60c net
Neck Yoke, Ironed complete, Irons all Wt., except End Ferrules, with Wt. Iron Rings.each, 70c net
Southern Plow Double Tree, Ironed complete, Irons all wrought.....each, 60c net
Wagon Box Strap Bolts—For Orders of 50 Set, 45 % dis.

10 in. long by 7-16 at Screw End, ₱ set of 8 bolts..						45c
12	"	½	"	"	8	" .. 55c
10	"	9-16	"	"	8	" .. 65c
12	"	9-16	"	"	8	" .. 70c
14	"	9-16	"	"	8	" .. 80c
10	"	⅝	"	"	8	" .. 80c
12	"	⅝	"	"	8	" .. 80c
14	"	⅝	"	"	8	" .. 90c
16	"	⅝	"	"	8	" .. 1 00
18	"	⅝	"	"	8	" .. 1 10
20	"	⅝	"	"	8	" .. 1 20

5c ₱ set for each additional inch over 14 in. All lengths made.
In ordering Box Strap Bolts please give diameter at Screw End.
Wrought Iron Bolster Plates, 2¾ in. wide, ₱ set.....45c
" " " 3 " " 50c
" " " 3¼ " " 55c
" " " 3½ " " 60c
Wrought Hammer Straps, heavy pattern, each.....13 c
" " light " each.....12 c
" Rub Irons, each.....9 c
Double and Single Tree Clips, figure 1, each.....8 c
" " " 2, each.....9 c
" " " 3, each.....11 c
Pole Caps, each.....20c
Strap Bolts, Bolster Plates, Hammer Straps, Rub Irons Clips and Pole Caps, in lots of 50 sets.....dis 15 %
For each order amounting to $20 net, or over, for the following goods: Wagon Hardware, Carriage and Tire Bolts, Rivets, Skein Bolts, Nuts, Washers, Chains, Bevel Box and Tongue Cap Iron, we will allow an extra discount of 10 per cent. off all Wagon Hardware, subject to discount, comprised in the order. Jobbers who do not deal in iron, we allow to substitute Strap and T Hinges in lieu of Bevel Box and Tongue Cap Iron to make order up to $20 worth and secure the extra discount of 10 per cent.
Single Tree Hooks, Nos. 1 and 2.....each, 3½c net
Single Tree Irons, New Pattern.....each, 4½c net
Stay Chain Hooks.....each, 3¼c net
Wagon Box Rods, narrow track, with Pat. Collar.....each, 7½c net
Wagon Box Rods, wide track, with Patent Collar.....each, 8½c net
Wagon Brake Ratchets.....each, 7 c net
" " " finished with guard..each, 20c net
Single Tree Iron, Wt. Hook, Malleable Ferruie.....each, 7½ net
Single Tree Iron, Wt. ⅜ Hook and 7-16 Clip..each, 7c net
Single and Double Tree Iron, Wrought Center Clip, ⅝ in. Welded, with ½ ℔. Ring...each, 10c net
Southern Plow Center Clip, ⅝ in. Welded, and 7-16 End Clip with 5-16 in. Hook—per set of 3 pieces. 20c net
Neck Yoke End Ferrule, Malleable, with Wt. Iron Ring.....each, 6½c net
Neck Yoke Attachment, with plates complete.....each, 23c net
Axle Tree Clips, No 1.....each 2¾c net
" " No. 2..... " 3¼c net
" " For Farm and Lumber Wagons.
Shank, 9-16 in., flat part 1¾ in.....each, 6¾c net
Plow and Wagon Clevises.....₱ ℔ 7c net
California Tire Rivets and Burrs, 5-16..... " 10c net
" " ⅜..... " 11c net
Wagon Box Staples, 1¼ to 2¾ in. to clinch. ₱ 1000 $10 75 net
" " " Bevel Box Iron, to rivet on, ₱ 1000 7 25 net
Neck Yoke Eyes, each.....1¾c net
" " with ⅝ rings, each.....7c net
King Bolts, ¾, 1, 1¼, and 1½ in. diam..... ₱ ℔ 3½c net
Wagon Rivets, ex. large flat, oval and steeple head, ¼ in. diam., 1 in. and longer..... " 7 c net
Wagon Rivets, 5-16 in. diam., 1 in. and longer " c net
" ⅜ to 1 inch long..... ₱ ℔ 1c extra
" & Nails, in 5 ℔ paper boxes..... " 1c extra
" " in 25 ℔ wood " ..... " ½c extra
Wagon and Hinge Nails, pointed by hand—
¼x3 and longer. 2½ & 2¾ 2 & 2½ 1¾ and shorter.
11c ₱ ℔. 13c ₱ ℔. 15c ₱ ℔. 17c ₱ ℔ net
3-16x3 and longer. 2½ & 2¾ 2 & 2½ 1¾ and shorter.
12c ₱ ℔. 14c ₱ ℔. 16c ₱ ℔. 18c ₱ ℔ net
Wagon Rivets and Nails, in less lots than one keg each size.....₱ ℔ ½c extra
Double Tree Plates..... " 7½c net
Coupling " ..... " 4½c net
Tongue " ..... " 7½c net
Neck Yoke Plates..... " 8½c net
Tongue Cap Iron, 1¾, 2 & 2½ in. wide, same price ₱ ℔ as No. 12 Band Iron.
Sand Band Iron, 1¼ in. wide, same price as No. 12 Band Iron.
Hub Band Iron, ¾c ₱ ℔ over price of same size Band Iron.
Wagon Chains, Stay, Lock and Tongue, 5-16 in. ₱ ℔ 7c net; ¼ in., 8c net.
Our prices are all subject to change of market, without notice.

The Garland for 1877.

MANUFACTURED BY

THE MICHIGAN STOVE CO.,

Of Detroit. Mich.

THE LEADING BASE BURNER.

It has no equal. Complete in construction. Beauty of ornamentation unsurpassed. Provided with Clinkerless and Adjustable Dumping Grate, and all the modern improvements. Nickel-plated Panels and Trimmings. Portable Turn Buckels. Nickel-plated Standards and Porcelain Evaporating Cups. Patent Portable Tea Kettle Attachments, which enables you to have water on your Stove at all times. Every Stove warranted. The Garland, with Low Down Oven provided with Automatic Shelf, will be found the most complete, doing its work as well as the best cook stove. Four sizes plain Stove, Nos. 25, 30, 40 and 50. Three sizes with Oven, Nos. 25, 30 and 40. One size Parlor Heater, No. 40. In addition to the above we manufacture a complete line of

Cooking, Parlor and Heater Stoves, Hollow Ware, &c.

Send for catalogue and price list.

N. B.—The Garland is also offered to the trade by

BARSTOW STOVE CO.,

Of Providence, New York, and Boston, Mass., for the Eastern and Middle States.

SPRING PERCH CO., Bridgeport, Conn.

Established 1843. Manufacturers of FIRST QUALITY

SPRINGS & AXLES

And Beer's Patent Curtain Rollers, Concealed Hinges, Etc., Springs of any pattern made to order. Send for Circular and Price List.

THE HARTFORD FOUNDRY AND MACHINE CO.,

Successors to the

WOODRUFF & BEACH IRON WORKS,

Hartford, Conn.

J. S. HUNTER, President.

E. J. MURPHY, Treasurer & Secretary.

High & Low Pressure Marine & Stationary

Steam Engines

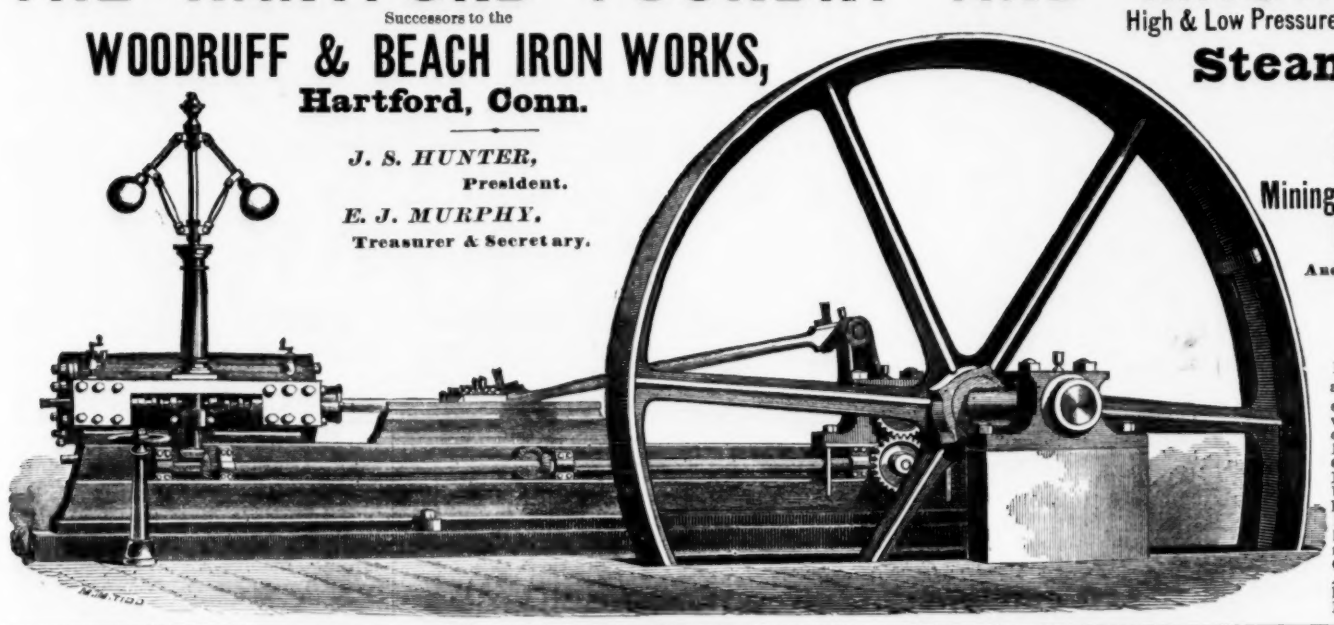
AND

Boilers,

Mining, Powder and Paper Mill

Machinery,

And every Variety of Iron and Composition Castings made to order.



The following are a portion of the Engines manufactured at these works and are a sufficient guarantee of our capacity for doing first-class work, viz.: The Pumping Engines in the cities of Brooklyn, N. Y.; St. Louis, Mo. and Hartford, Conn., and in the Charlestown, Mass. and Norfolk, Va. Navy Yards, and the engines in the U. S. Steam Sloops of War Michigan, Kearsage, Manitou, Minnetonka and Piscataqua and the Gun Boats Cayuga, Pequot and Nipsic, the Government Transports Dudley Buck and Geo. C. Collins, and the Steamships America and United States. Also the large Horizontal Engine for the new Plate Mill of the Bay State Iron Co.

A. H. MERRIMAN,

Patent Power

Punching Presses.

Patentee and Sole Manufacturer.

I warrant every part of this Machine to stand the shock of the wheel running at 125 revolutions.

West Meriden, Conn.

Machinery Hall, Philadelphia, Section B 4, Columns 28 and 29.

RICHARD DUDGEON,

No. 24 Columbia Street, New York,

MAKER AND PATENTEE OF

Hydraulic Jacks and Punches,

ROLLER TUBE EXPANDERS

And Direct-Acting Steam Hammers.

Communications by letter will receive prompt attention.

JACKS for Pressing on Car Wheels or CRANK PINS made to order.

BUCKET PLUNGER

VALLEY MACHINE CO. EAST HAMPTON MASS.

STEAM PUMP

RIVAL STEAM PUMPS

THE CHEAPEST AND THE BEST FOR HOT & COLD WATER. $45.00 AND UPWARDS. SEND FOR CATALOGUE

15 SIZES MANUF'D BY JOHN.H. McGOWAN & CO CINCINNATI

STEAM ENGINES

CLIPPER Vertical Engines, off and on wheels! Price on wheels, 6 horse-power, $485; 8 horse on wheels, price, $700. **Dry Steam** Horizontal Engines, 8 horse power Climax, on wheels, $925. Builders of Stationary Engines, 4 styles, from 6 to 200 horse power. Corliss Engines, Extra Finish and Cut-Off Engines, Crank, Stationary and Plain Finished Engines. Boilers, Circular Saw Mills, &c. Successors to Utica Steam Engine Co., formerly Wood & Mann. Established 1857. We have the *largest* line of Engine Patterns in the United States.

TAYLOR MANUFACTURING CO.,
Westminster, Maryland.

N. Y. MALLET and HANDLE WORKS

Manufacturers of

Calkers', Carpenters', Stone Cutters' Tin, Copper and Boiler Makers'

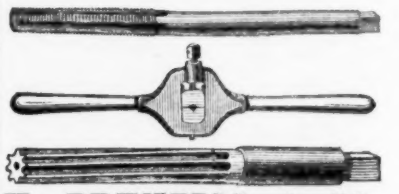
MALLETS,

Hawsing Beetles, Hawsing and Calking Irons; also all kinds of Handles, Sledge, Chisel and Hammer Handles. Also

COTTON AND BALE HOOKS.

Patented Feb. 13, 1877; a new combination of Hooks.

456 E. Houston St., New York City.



H. PRENTISS & CO.,

Sole Manufacturers of

GODDARD'S PATENT-RELIEVED

Machinists' and Gas Fitters'

TAPS,

AND SOLID REAMERS,

AND DEALERS IN

Machinists' Supplies.

E. A. GODDARD,

Late N. Y. Tap & Die Co.,

General Sales Agent, *14 Dey Street, New York.*
Send for Price List.

Trade Mark.

IRON PAINT

The Cheapest and most Durable Paint known for Cars, Roofs, Bridges, Iron, Brick and Wooden Buildings, etc. All Paint guaranteed as represented, and trial orders solicited.

Pittsburgh Iron Paint Co.,

PITTSBURGH, PA.

The Diamond Drill

FOR

PROSPECTING LANDS

Produces Cylindrical Sections, or Cores, the whole distance bored.

A TRUE RECORD GUARANTEED.

PRICES REDUCED.

Artesian wells bored round and straight. Deep blast-holes bored for sinking shafts and driving tunnels by the new process. Prospecting Drills and Improved Diamond Quarry and Channeling Drills made and sold with right to use.

Address

PENNA. DIAMOND DRILL CO., Pottsville, Pa.

EUREKA SAFETY POWER!

Practically **impossible to explode.** Tested to 300 lbs pressure per square inch. Will slit 2 inch seasoned oak—grinds bushels Corn per hour. **Price $250.** Also, Stationary Engines and Boilers and **Spark Arresting Portable Engines** for plantation use. Send for our circular. Discount to the trade.

W. B. PAYNE & SONS,

Corning, N. Y.

BOSTON.

Reported by Macomber, Bigelow & Dowse, 156 to 164 Oliver St.

Anvils.—"Eagle American".....per lb. 9c; dis 20 %
Augers.—Watrous Ship.....dis 10 %
L'Hommedieu Ship.....dis 30 %
Axes.—Blue Jacket.....9 00
Racer.....8 00
Red Cross, Handled.....10 50
" " Boy's.....9 00
Blue Jacket " " 10 00
Axe Handles.—Wadleigh's Oak—
A (Extra) $2 50, B (No. 1) $2 00, C (No. 2) $1 50 ₩ doz
Blind Hinges.—Orr or Wasnburn's..₩ hun d sets $8
Blind Pasts.—
Orr or Washburn's.....per hundred set $6 00
Bolts.—Carriage, Phila.....dis 60&20 %
Carriage, Common.....dis 75&10 %
Borax.—Best Refined.....₩ lb 11c
Borers.—Angle, Baskus'.....dis 30 %
Boring Machines.—Angle.....each $4 50
Common, Snell's quality.....each $ 50
Braces.—Barber's.....dis 30&5 %
Backus'.....new list 50&10
Spofford's.....dis 50 %
Bracket
Saw Frames, with patterns complete.....₩ doz $6 00
Saws....." 88
Saw Frames, Centennial....." 3 50
Star Bronzed.....new list net
Star Japanned.....new list net
Store Shelf.....new list net
Brass Faucets.—L. F. & C.....dis 40 %
Brushes.—Horse, Patent Metallic.....per doz. $4 50
Butts.—Union Drilled Loose Joint.....dis 55&10 %
" " Wire Fast Joint.....dis 40&10 %
" " Acorn Loose J't.....dis 55&10 %
Brass Butts.....dis 30 %
Wrought Table Butts and Back Flaps.....revised list, dis 35 %
Wrought Narrow Butts.....reduced, dis 40 %
Cards.—
Curry Cards, No. X, per doz., $0 55.....dis 30 %
Horse " No. X, " 0 80.....dis 30 %
Wool " No. 8X, " 2 50.....dis 15 %
Cotton " No. 10, " 3 50.....dis 10 %
Cartridges.—U. S. Cartridge Co.....dis 60 %
Chisels.—"Back Bros." Shank Goods.....dis 40 %
Socket.....dis 25 %
Compasses and Dividers.—Bemis'.....dis 40 %
P. S. & W.....dis 30 %
Cordage.—Manila (usual trade dis.).....₩ lb 14c
Corn Hooks......per doz $2 75
Crow Bars.—Solid Steel.....₩ lb, 9c
Cow Ties......dis 30 %
Dividers.—Cook's Nickel Plated.....dis 15 %
Door Springs.—Mosely—

Per doz.	$9 00	12 00	15 00	18 00	24 00
No.	0	1	2	3	4

Torrey's.....$2 50
Gem.....dis 10 %
Drills.—Whitney's with Chucks.....$12 50
Emery.—Alden.....₩ lb 7c
Wellington Mills.....₩ lb 10c
Files.—American.....dis 30 %
Nicholson, new list.....dis 30 %
Wheeler, Madden & Clemson.....35 to 5; 10 %
Stubb's Tapers, genuine, 3 in., $1 50; 3½, $1 62½, $1 88; 4½, $2 13; 5, $2 50
Hammers.—Maydole—new reduced list.....dis 15 %
M., B. & D., solid cast steel, adze eye, No. 1, $10; 1½, $9 75.....dis 25 %
M., B. & D., solid cast steel, belt face, No. 1 $11; 1½, $9 75.
Hammond—new reduced list.....dis 15 %
Hangers & Rollers.—Anti-Friction.....dis 40 %
Climax.....dis 40 %
Acme Rollers.....dis 40 %
Hatchets.—Underhill Edge Tool Co.....dis 25 %
C. F. Dowse, warranted Cast Steel—
Shingling.....0, $4 75; 1, $5 25; 2, $5 75
Claw.....1, $5 75; 2, $6 25
Lathing.....1, $5 50
Axe Pattern.....1, $7 00; 2, $7 50
Broad.....0, $5 75; 1, $6 50; 2, $7 50; 3, $9 25; 4, $10 75
5, $12 75; 6 $14 75
Hinges.—Strap and T Stanley Works.....dis 60 %
Plate, Loose and Fast Joint.....₩ lb 5c
Wrought Screw Hook.....₩ lb 5c
Knobs.—Imp. Extension Silvered Glass.....₩ doz $8 00
Lanterns.—Tubular No. 0.....$10 00
Guarded, No. 74, (with kerosene oil and candle burners).....5 50
Lead.—Sheet, 9c.; Pipe, 8½c.....dis 10 %
Locks.—Norwalk Lock Co.....dis 50 %
Mattocks.—
K. P. & Co.. axe finish, long cutter.....$11 50—net
Short cutter.....11 00—net
Meat Cutters.—"Miles's" Challenge.....dis 30 %
No. 1, $22 00; 2, $30 00; 3, $40 00.
Metal.—Babbitt.....No. 1, 35c; 8, 25c; 5, 15c ₩ lb
Nails.—10d and larger.....$2 50
Nail Pullers.—Little Giant—Small.....per doz., $22 00
Little Giant—Large.....30 00
Padlocks.—Wilcox.....dis 33½&5 %
Picks.—R. P. & Co., Solid Eyes.....5 to 6 | 6 to 7

	$9 00	$9 50

Pins.—Universal Hatand Coat all wood—
2 in.....₩ gross $2 50; 3 in., $ 50; 4 in., 4 50—dis 15 %
Pumps.—Auburn Tool Co.....dis 40 %
N. Y. Tool Co.....dis 50 %
Plated Ware.—Rogers Bros.....dis 40 %
Pocket Knives.—Conn. Cutlery Co.....new net list
American Shear Co.....new net list
Plumb & Levels.—Stanley.....dis 60&10 %
Pulleys.—Axle.
Prime pol. wh't pt. face, No. 15, 1 ¾ in., 30c.; 16, 2 in., 26c.
Pol. wh't br'zed face No. 115, 1¾ in., 20c.; 116, 2 in., 26c.
Pulley Blocks.—"Best Boston Make".....net
Rail Karn Door.—For Novelty and Anti-Friction Hangers.....per foot 7c.. dis 40 %
Refrigerators.—Heinz Patent.....dis 20 %
Rivets.—Black.....dis 40 %
Carriage, oval head, Nos. 3, 4, 5, 6, 7, 8.....dis 30 %

	13	13	14	14	15	16c ₩ lb

Sad Irons.—Bliss & Drake.....₩ lb 3½c
Sand Paper.....dis 15 & 5 %
M. B. & D.....0 to 2, $4 25; 2 to 3, $4 75
Saws.—*Hand and Panel*—
X Cut, Wheeler, Madden & Clemson.....per ft., 35c
" Champion....." 45c
" Lightning....." 45c
" Great American....." 50c
Wood Saws, Welsh & Griffith.....₩ doz $14 00
Wheeler, Madden & Clemson's, same list as "Disston's".....dis. 20 %
Disston's.....dis. 20 %
Saw Horses.—Extra.....₩ doz $2 25
Folding....." 3 00
Screws.—Am. Screw Co., new list Sept. 1st dis 60&10 %
Aiken's.....dis 60&10 %
Scythe Stones.—
"Willoughby Lake," first quality.....₩ gross $4 50
" " second quality....." 3 00
Shovels.—O. Ames.....dis 30 %
M. B. & D.....dis 30 %
Spading Forks.—W. C. & Co.....dis 40 %
Tools.—Aiken's Pattern.....₩ doz $5 00
Aiken's Genuine, $13.....dis 40 %
" Saw Sets, $13.....dis 40 %
Traps.—Oneida.....dis 25 %
Blake's.....dis 40 %
Vises.—E. P. & Co.'s Solid Box. Blacksmith.....₩ lb 12c
Parker's Parallel.....dis 10 %
Backus.....dis 25 %
"Howards." Parallel.....dis 25 %
Wardrobe Hooks.—Wire to drive.....₩ gross $1 00
Weights.—Window Weights.....₩ lb 12c
Wedges.—Axe.....₩ doz 53
Wire.—
Eureka in spools, No. 28 to 40 assorted...₩ gross $3 50
Wire Netting.—Clinton Wire Cloth Co., Green, 4½c
Drab or Black.....₩ ft 4½c
Wrenches.—Genuine Wrenches, G. A. Coes..dis 40&10%
Wringers.—Universal XX No. 2.....₩ doz $66 00
Novelty, No. 10....." 63 00
" No. 2....." 66 00
" No. 22....." 70 00
Excelsior A, with bench....." 84 00
" E, set tubs....." 72 00
Eureka....." 57 00
Welcome....." 60 00
Witnington, Cooley & Co.—Hoes, Rakes, Forks &c. dis 40 %. Special rate for Export.

ST. LOUIS.

Corrected weekly by Semple & Birge Mfg. Co.

Animal Pokes.....$7 50 ₩ doz. net
Apple Parers.—Conqueror.....₩ doz $7 75
Hudson's Rotary.....7 75
Axes.—Wm. Mann's, Red Warrior.....₩ doz 9 75
"C. Marshall".....9 25
Handled.....$3 extra
Double Bitted.....19 20
Hunt's.....13 00
Axles.—"Jones, Henry & Co.'s" Patent Lubricating, Half Patent Swelled Taper, Plain Taper and Concord Axles.....dis 30 %
Common Axles (Pat. Lubricating), 1¼ inch and upward.....₩ lb. 6c
do. less than 1¼ inch....." 6½c
Babbitt Metal.—

Nos.	4	3	2	1	A 1	Genuine.
	9½	11	16½	20	31	35c ₩ lb.

Bellows.—Best St. Louis make, new list....dis. 12½ %
Bells.—Troy, Church, School and Farm Bells..₩ lb 50c
"Improved Amalgam Bronzed" 15 in., $2 00; 17 in., $2 50; 19 in., $4; 21 in., $5; 24 in., $14; 27 in. $19 50
Belting.—"Boston Belting Co.'s Rubber. dis 50&10 %
Bradford & Sharp's" Oak-Tanned Leather.... dis 35 %
Boilers.—Farmer's Front Feed Boilers.....dis 30 %
" Caldrons.....dis 25 %
" Sugar Kettles.....dis 30 %
Bolting Cloth.—New gold list.....net
Bolts.—Arms, Bell & Co.'s Carriage & Tire..dis 70 & 10%
Butts.—Western Butt Co.'s new list—
Narrow Fast Joint.....dis 25, 12½&10 %
Broad Fast Joint.....dis 25, 12½&10 %
" Loose " .....dis 45, 12½&10 %
Reversible.....dis 40, 12½&10 %
" Japanned and Silver Tipped..dis 50, 12½&10 %
Loose Joint "Acorn" " " ..dis 15, 12½&10 %
Churns.—Julien, No. 2, $7 00; No. 3, $7 50; No. 4, $8 50.....dis 25 %
Cider Mills.
Buckeye Senior $27 00; Buckeye Junior, 18 00.....net
Corn Knives.—Dunn Edge Tool Co.'s Clip...₩ doz 4 50
Seymour Mfg. Co.'s Solid Steel Back.....4 50
Corn Shellers.—Sandwich Mfg. Co.'s—
Power Shellers.....dis 10 %
Hand Shellers.....Special rates
Cotton Gins.—Carver, with 10 in. Saws, $7 50 a Saw, net
12 in. Saws, $8 00 a Saw.....net

Crow Bars.—Steel Pointed.....₩ lb 6c
Drag Saw Machines.
Culver's Iron Drag Saw.....dis 15 %
Excelsior Drag Saw with Log Trucks.....dis 12½ %
Fanning Mills.—Nash & Cutt's.....dis 25 %
Feed Cutters.—Burdick National.....new list, net
Sanford No. 1, $10 00; No. 2, $8 00.....net
Bowman's Lever Cutter, $6 50.....net
Files.—Black Diamond, Mill.....$5 00 £ currency
" Bastard.....5 00 £ currency
" Taper.....5 00 £ currency
Forges and Blowers.
Keystone Portable Forge Co.'s.....dis 10
Forks and Hoes.
Auburn Mfg. Co.'s Hay and Manure Forks...dis 35 %
" " Handled Hoes.....dis 35 %
Garden Seed Drills and Wheel Hoes.
Allen's Double Wheel Hoe.....dis 20 %
" Planet Drill, Nos. 2 and 3.....dis 25 %
" Combined Drill and Wheel Hoe.....dis 25 %
Grinding Mills.—Challenge Feed Mills.....dis 15 %
Sedgebeer's Nonpareil Mills.....dis 15 %
Bradford's French Burr Mills.....dis 5 %
Hammers.—Masons' Hammers.....₩ lb 18c
Smiths' Hand.....' 18c
Handles.—No. 1 Fork, Hoe and Rake.....dis 25 %
No. 2 Fork, Hoe and Rake.....dis 30 %
Ax, Pick, Sledge and Small Handles.....net list
Hay and Cotton Presses.
Dederick's Railroad.....dis 10
" Perpetual.....dis 10
Hay Knives.
Dunn Edge Tool Co.'s.....₩ doz $12 00 net
Lightning (Weymouth's Patent).....₩ doz $30 0
Horse Nails.—National Patent Pointed.....20c rate
National Patent Pointed, extra finished.....22c "
Horse Powers.—Pitts or Carey's Patent.....dis 10 %
Wheeler's Railway.....dis 10 %
Sandwich Lever.....dis 10 %
Hose.—
Boston Belting Co.'s Rubber Medium Sizes..dis 30&10 %
" " " S. Siz. Hydrant..dis 40 %
Mattocks and Grub Hoes.
Klein, Logan & Co.'s Mattocks....₩ doz $11 25 @ 11 60
" Grub Hoes, oval eye " 8 50 @ 9 25
Money Drawers.—
Pierpont & Co.'s Excelsior.....per doz $33 00 net
Nails.—Wheeling Riverside Brand.....$2 50 rates
Packing.—Boston Belting Co.'s Rubber, Plain..dis 30 %
Boston Belting Co.'s Rubber, Pure.....dis 25&5 %
" " No. 1 Plain.....dis 40 %
" " Round and Square....dis 10&10 %
Picks.—Railroad and Clay.....₩ doz $8 00 @ 9 75 net
Coal.....6 50 @ 7 20 net
Pon.....9 45 @ 10 15 net
Stone.....11 00 @ 11 60 net
Tamping.....11 75 @ 12 25 net
Miners Drifting.....7 80 @ 10 60 net
Plows.—Avery's Cast and Steel.....dis 20 %
Avery Sulky Plow.....dis 20&5 %
Collins Cast Cast Steel.....new list net
Pekin Steel.....dis 25 %
Plow Sulky.—Buckeye.....$27 00 net
Post Hole Augers.—Clark's Patent—
No. 1, ₩ doz. $27; No. 2, $30; No. 3, $32.....dis 25 %
Pulleys.—5 inch.....per doz $3 70 net
4 inch.....per doz 2 50 net
Pumps.—St. Louis Farm, Patent Metal Lined..dis 30 %
Rakes.—Advance Paddock Sulky.....each $24 00 net
St. Louis Revolving 14 tooth.....4 45 net
" " 15 " .....4 65 net
" Hand Hay Rake.....per doz $2 50
Reaper Knives and Sections.—
Geo. Barnes & Co.'s Knives.....dis. 40 %
" " Sections.....dis 40 %
Road Scrapers.—Steel.....each $3 50 net
Cast Iron.....dis 10&5 %
Saws.—Curtis & Co.....dis 15 %
Scythes.—Dunn Edge Tool Co.'s.....dis 30 %
Scythe Stones.—No. 1 Ind'n Pond ₩ gr's, $7 00
Extra Indian Pond.....7 50
Premium.....10 50
Diamond Grit.....13 00
Shovels and Spades.—Groom Shovel Co...dis 40 %
Grain Scoops—Patent Cor'd Straps Groom Shovel Co.....dis 40 %, and 50c per doz extra
do. M. Rowland & Co., dis 30 % and 50c " "
do. O. Ames & Son, dis 27½ % and 50c " "
Sledges.—Smith's Stone or Coal Sledges—
Steel Face Polished.....₩ lb 14c net
Solid Cast Steel.....' 10c net
Spaths and Cradles.—Seymour Mfg. Co.'s.....dis 40 %
Sorghum Machinery.—Bell Cane Mills.....dis 30 %
Scantlin's Seamless Pans and Evaporators.....dis 20 %
Springs.—Cleveland Spring Co.'s—
Carriage and Express.....₩ lb 14½
Blue Seat Springs.....₩ pair, $1 00
Thimble Skeins.—Whitewater's.....dis 40&10 %
Vises.—Wilson Mfg. Co.'s.....₩ lb, 14½c
Wheelbarrows.—Champion Iron Wheel..₩ doz $49 50
Champion Wood Wheel.....₩ doz 27 50
" Garden.....₩ doz. 39 00
Wagons.—Whitewater Farm Wagons—
Thimble Skein—
2¾ in., $66; 3 in., $67 50; 3½ in. $70; 4 in. $71
Wire Bale Ties.—Buckeye Double Twist....net list
Dederick Adjustable.....new list, dis 25 %

St. Louis Metal Market.

(Corrected Weekly by Messrs. R. Sellew & Co.)

Tin Plate.

IC, 10x14, Best Char..	$ 7 50	DX, 12½x17, B. Cha.	$10 00
IX, 10x14, " ..	10 00	DXX, 12½x17 " ..	12 50
IC, 12x12, " ..	7 50	DXXX, 12½x17 " ..	15 00
IX, 12x12, " ..	10 00	IC, 20x28, " ..	17 50
IC, 14x20, " ..	7 50	IX, 20x28, " ..	22 00
IX, 14x20, " ..	10 00	IXX, 20x24, " ..	23 00
IXX, 14x20, " ..	12 50	IC, 14x20, Best Roof..	6 75
IXXX, 14x20, B. Char.	15 00	IX, 14x20, "	9 25
IXXX, 14x20, " ..	17 50	IC, 20x28, " ..	14 00
IC, 12x24, " ..	8 00	IX, 20x28, " ..	18 00
IX, 14x14, " ..	18 00	IC, 10x14, Best Coke..	6 50
IXX, 14x14, " ..	21 00	IC 14x20, " ..	6 50
DC, 12½x17, " ..	7 50	IC, 10x20, " ..	10 50

Sheet Iron.	Com'n.	S L U D. Ref'd Smth.	Juniata Sm'th
No. 16 to 20	3 20	4 30	5¾c ; 9c
No. 22 to 24	3 20	4 30	5¾c 9c
No. 26	3 40	4 40	6c 9 10c
No. 27	3 60	4 60	6¾c 9 30c

Genuine Russia Iron.
Perfect—No. 9, 10, 11, 12.....per lb. 13½c
No. 1 Stained—No. 9, 10, 11, 12.....per lb. 12½c
Tare 24 lbs. to Bdle. For less than Bdle. add 1c. ₩ lb.
Patent Planished Iron.
No. 24 to 27, A quality.....per lb. 11c
" 18 " " 9½c
For less than Bdle. add 1c. per lb.
Galvanized Sheet Iron.
Juniata, or 1st quality.....dis 40 %
Block Tin.

Banca, Large Pigs	21c	do. Small	21c
Straits, Large Pigs	20c	Bar	23c
Eng. Ref'd, Large Pig	24c		

Solder.

Extra in Bars	14c	No. 2, in Bars	12c
No. 1, in "	13c	Spelter Solder	26c
Pig Lead—Pigs	7c	in Bars	9c
Antimony			15c
Bismuth			$2 75
Nickel			3 00
Crucibles.—Dixon's			₩ No. 5c

Babbit Metal.

No. 1	₩ lb. 18c	No. 3	₩ lb 15c
" 2	" 16c	" 4	" 8½c

Copper.
Brazier's, 30x60, 14 to 100 lbs. Sheets.....30c
" 10, 11 & 12 lbs., " 32c
" 8 and 9 lbs. " 34c
" 6 and 7 lbs. " 36c
Tinned, 14x48, 14 and 16 oz.....28c
Planished, 14x48, 14 and 16 oz.....38c
" Boiler Sizes, 14 and 16 oz.....4 c
Gutter Copper, 20 and 24x72, 10, 11 and 12 ₩ Sheets.....32c
" 14 ₩ Sheets.....30c
Reservoir Copper, 16x60 and 18x60.....33c
Bar Copper, Square and Round, ⅜ to 1⅛ inch.....31c
" " ⅜ inch.....34c
Copper Bottoms.....30c
Soldering Coppers.....30c

Brass.

Roll, No. 18 to 28, 12 in. in width			30c
" 30, 12 in. in width			31c
" 32, 16 "			36c
" 34, 16			37c
" 36, 16			39c
Platers, No. 40, 6			53c

Brass and Copper Wire.

	Brass.	Copper.		Brass.	Copper
No. 0 to 20	34c	45c	No. 24	39c	50c
" 21	37c	46c	" 25	42c	53c
" 22	36c	41c	" 26	44c	56c
" 23	37c	48c	" 27	46c	60c

Brass Spring Wire, 3c. ₩ lb advance.
Brass Tubing.
Plain to No. 20.....45c | 5-16 inch.....50c
⅜ inch.....50c | ½ " 53c
Copper Rivets and Burs......dis 10 %
Brass Kettles......₩ lb 43c
Sheet Zinc.—600 lbs. cask.....' 7c
250 lbs. cask.....' 7¼c
Sheet.....new 7½c
Wire.—Iron, Bright Market.....new dis 52½ %
Iron, Coppered Market....." dis 47½ %
Fence, Nos. 7, 8 and 9....." ₩ 5 ½c
Trellis, Nos. 10 and 11....." 5c
" No. 14....." 5 25
Hay Baling, Charcoal, No. 9 and 11....." 5¾c
" " No. 12....." 5¾c
Broom, Tinned, Nos. 18 to 22....." 17c
Fence Staples.....per keg of 100 lbs. $4 00
Per 10.....5½
Iron Rivets.—Black, papered.....new dis 5
Tinned, papered....." dis 5
In bulk.....new 3-16 | ¼ | 5-16 | ⅜ | in. diam.
" 11½c | 10½c | 10 c | 9½c per lb.
Sad Irons......7 to 8½c
Enameled Kettles.—Standard Mfg. Co.....dis 5
Enameled Sauce Pans.
Standard Mfg. Co.....dis 5
Enameled Boilers.—Standard Mfg. Co.....dis 5
Dripping Pans.—Smooth Iron.....₩ lb
Geneva Fluters.....per doz $15 00
Monroe Fluters.....' 14 50
Stove Polish.—Dixon's.....per gross 6 00
Gem.....4 50
Japanese.....3 50
Dixon's, in bulk.....₩ lb 10c
Coffee Mills.—Parker's.....dis 30 %
Granite Iron Ware.....dis 35 %
Spoons.—New list.....dis 10 %
Retinned Iron Ware.....45 % off
Plain Stamped Ware.....50 % off
Japanned Ware.—St. Louis list.....dis 40&5 %
Fry Pans.....dis 40 %
Pans.....dis 30 %

THE JUDSON GOVERNOR.

It is a common method to advertise Governors *without cost*, unless satisfactory to the customer, and then charge *High Prices* for doing what any good Governor will do. Various Governors inferior to the "Judson" are sold in this way, operating well enough for three months, to insure collection of the pay, but becoming useless after a year's wear—their construction lacking durability. The Judson Governor is guaranteed to be not only the best Regulator of Steam Engines, but also the most durable Governor made. Parties in buying other Governors should stipulate that their durability be guaranteed, and should also take care that they do not for much inferior Governors, pay higher prices than those shown in the accompanying list. We guarantee the Judson Governor will do all any other Governor can do, and in Accuracy and Durability—the main essentials—we guarantee it shall do more.

Reduced Price List,

FEBRUARY 1, 1877.

☞ For dimensions of Governor, see Illustrated Price List.

THE JUDSON PATENT

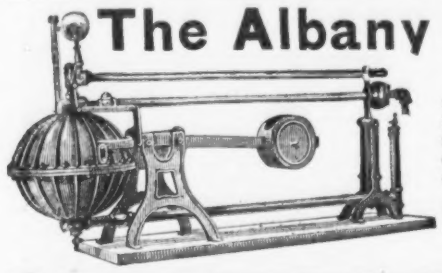
Improved Steam Governor.

Size, Inch.	Plain.	Bright Finished.	Extra for Spe'd'r	Stop Valves.
¾	$16·00	$18·00	$1·90	..
¾	18·00	20·00	1·90	..
1	20·00	22·00	2·00	$5·00
1¼	23·00	26·00	2·25	6·00
1½	26·00	30·00	2·50	8·00
2	31·00	35·00	2·75	10·00
2½	36·00	41·00	3·25	12·00
2½	40·00	45·00	3·50	14·00
2¾	45·00	51·00	3·75	16·00
3	50·00	57·00	4·25	19·00
3½	59·00	67·00	4·50	23·00
4	69·50	78·00	5·00	28·00
4½	80·00	90·00	5·50	34·00
5	90·00	101·00	6·00	40·00
5½	105·00	117·00	6·50	46·00
6	120·00	133·00	7·00	54·00
7	142·00	156·00	8·00	65·00
8	175·00	192·00	9·00	79·00
9	198·00	218·00	10·00	..
10	210·00	240·00	12·00	..

No Charge for Boxing & Cartage.

JUNIUS JUDSON & SON, Rochester, N. Y.

The Albany Steam Trap.



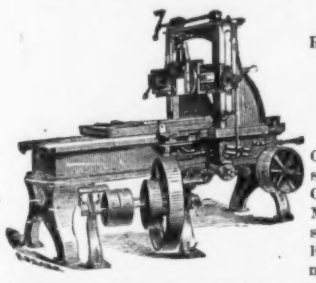
This Trap automatically drains the water of condensation from *Heating Coils*, and returns the same to the Boiler *whether* the Coils are *above or below* the water level in Boiler, thus doing away with pumps and other mechanical devices for such purposes. Apply to

Albany Steam Trap Company,
Albany, N. Y.

The Pratt & Whitney Co.,

Hartford, Conn.,

Have constantly on hand and making



Drop Hammers

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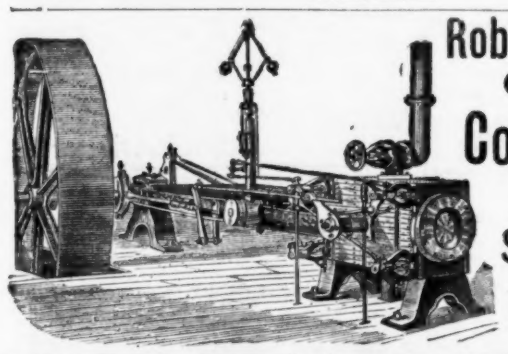

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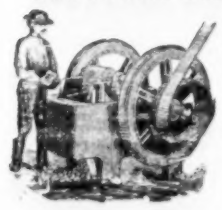

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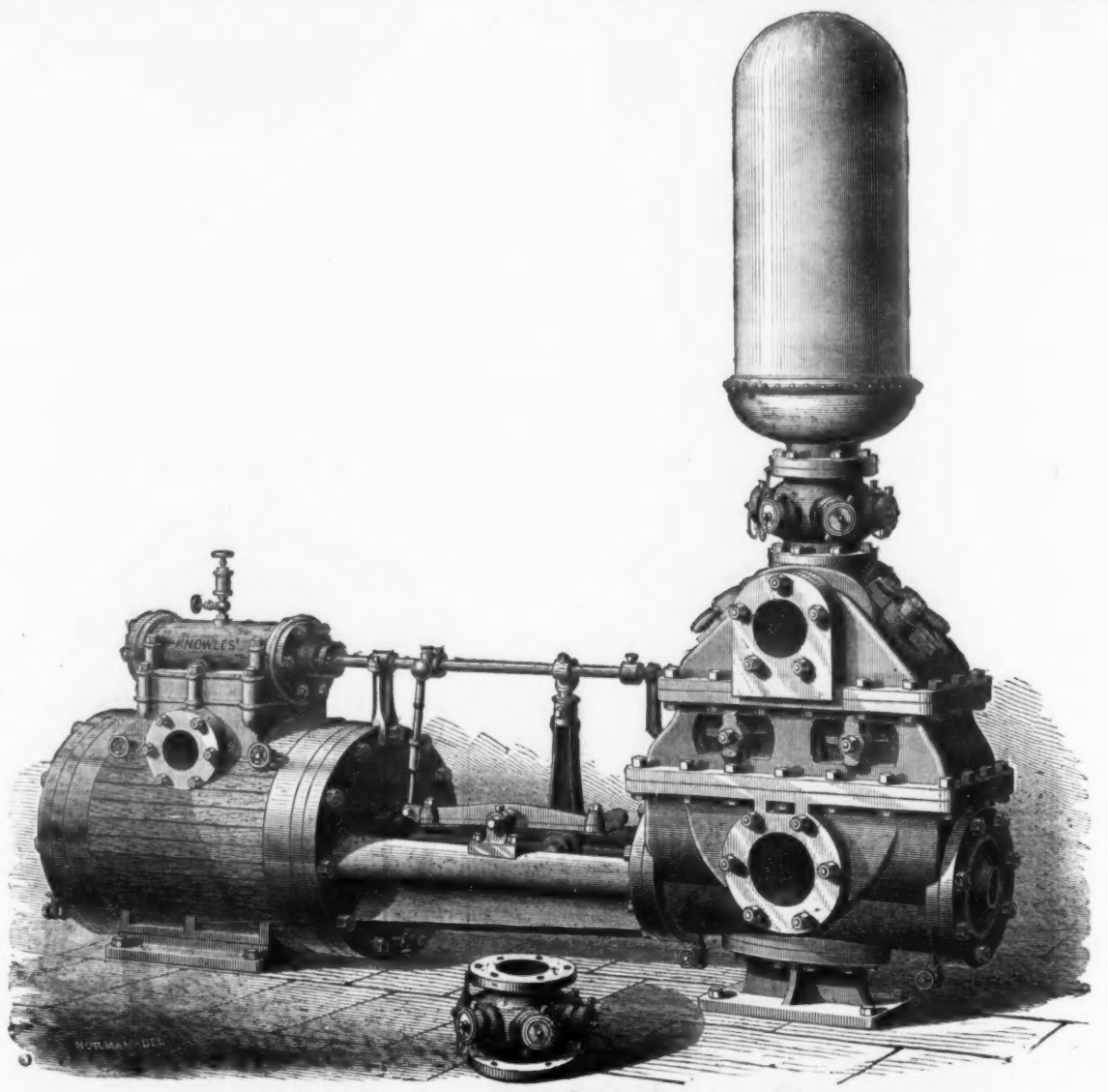

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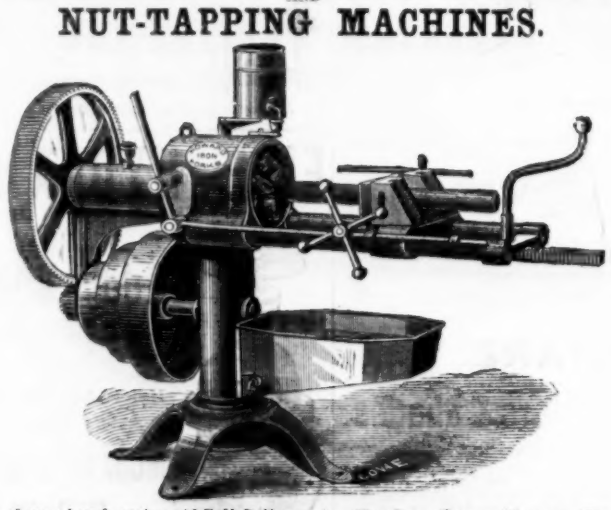

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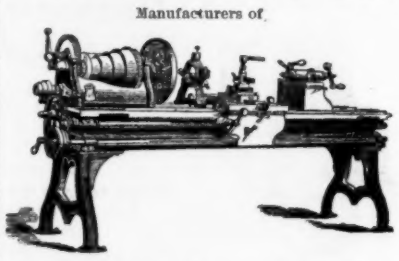

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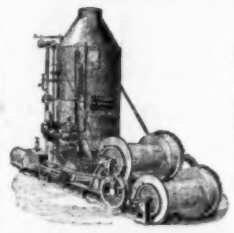

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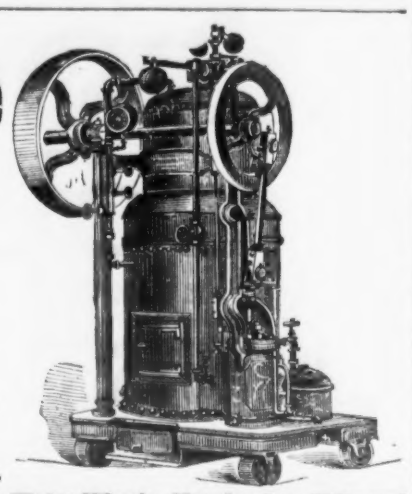

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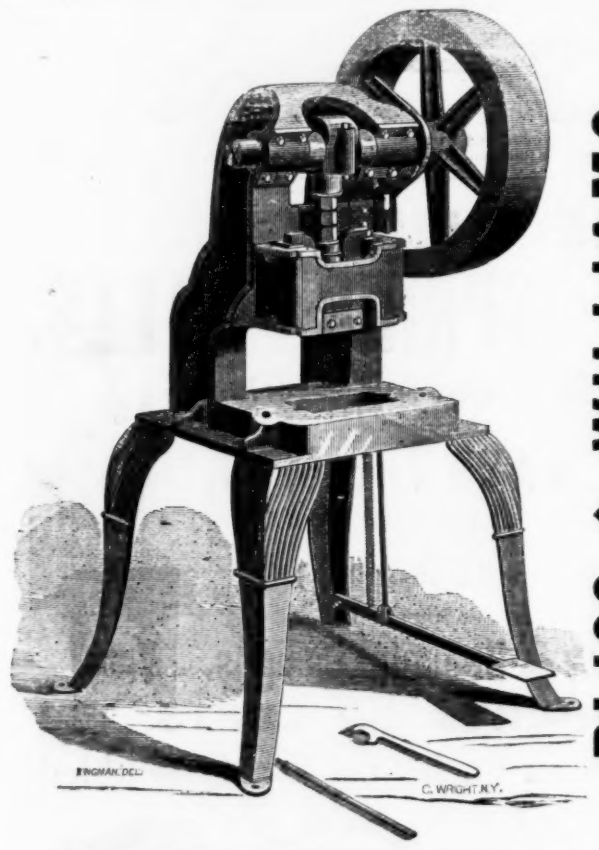

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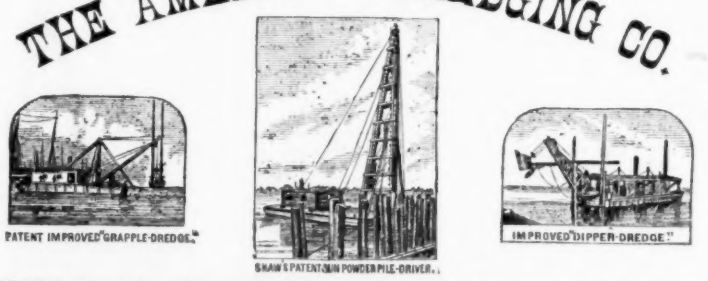

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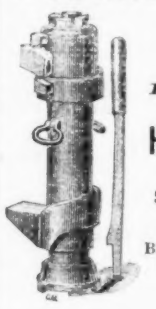

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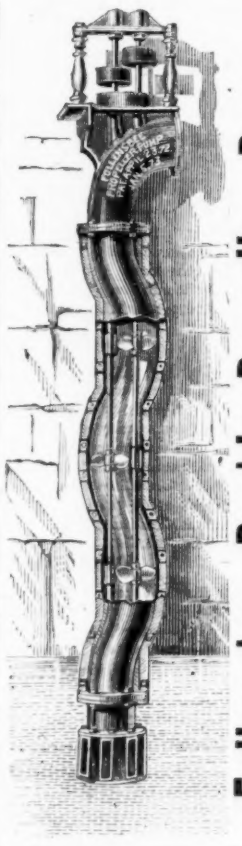

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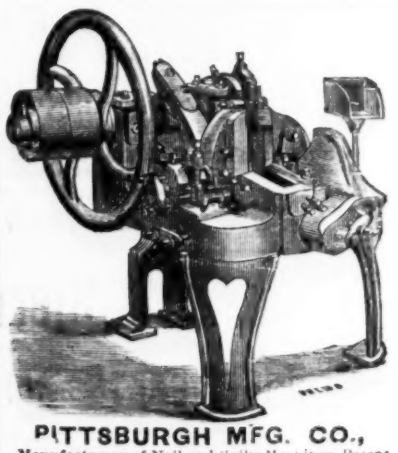

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